United States Department of Agriculture

Heavenly Mountain Resort 2017 Capital Improvements Project

Environmental Assessment

Forest Service
Lake Tahoe Basin Management Unit

El Dorado and Toiyabe National Forests
November 2017

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Table of Contents

Figures

Tables

Acronyms

Acronym/ Abbreviation	Definition
ABA	Architectural Barriers Act
AIS	Aquatic Invasive Species
BA/BE	Biological Assessment/Biological Evaluation
BEIG	Built Environment Image Guide
BMPs	Best Management Practices
BMPEP	Best Management Practice Evaluation Program
Caltrans	California Department of Transportation
CAR	Critical Aquatic Refuge
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CLM	California Land Management
CO	Carbon Monoxide
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationship System
DBH	Diameter at Breast Height
DOE	Determination of Eligibility
DVT	Daily Vehicle Trips
EA	Environmental Assessment
EIP	Environmental Improvement Program
EIS	Environmental Impact Statement
ERA	Equivalent Roaded Acres
ESA	Endangered Species Act of 1973 as amended
FONSI	Finding of No Significant Impact
Forest Plan	Lake Tahoe Basin Management Unit Land and Resource Management Plan
Forest Service	USDA Forest Service (USFS, FS)
FSORAG	Forest Service Outdoor Recreation Accessibility Guideline
GFA	Gross Floor Area
GHGs	Greenhouse Gasses
GIS	Geographic Information System

Acronym/ Abbreviation	Definition
HUC	Hydrologic Unit Code
IDT	Interdisiplinary Team
LEED	Leadership in Energy and Environmental Design
LOP	Limited Operating Period
LRMP	Land and Resource Management Plan
LRWQCB	Lahontan Regional Water Quality Control Board
LTBMU	Lake Tahoe Basin Management Unit
LCT	Lahontan cutthroat trout
MIS	Management Indicator Species
MIS Report	Management Indicator Species for the Lake Tahoe Basin Management Unit
MVUM	Motor Vehicle Use Map
ND	Neighborhood Development
NDEP	Nevada Department of Environmental Protection
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NO_x	Nitrous Oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OHV	Off-Highway Vehicle
PAC	Protected Activity Center
PAOT	Persons At One Time
PCT	Pacific Crest Trail
PM10	Particulate Matter less than 10 microns in diameter
RCA	Riparian Conservation Area
RCOs	Riparian Conservation Objectives
ROS	Recreation Opportunity Spectrum
ROW	Right-of-Way
SEZ	Stream Environment Zone
SHPO	State Historic Preservation Officer
SNF MIS	2007 Sierra Nevada Forests Management Indicator Species
SNFPA	Sierra Nevada Forest Plan Amendment

Acronym/ Abbreviation	Definition
SNYLF	Sierra Nevada yellow-legged frog
SO_2	Sulfur Dioxide
South Shore Project	South Shore Fuel Reduction and Healthy Forest Restoration Project
TEPCS	Threatened, Endangered, Proposed, Candidate species and FS Sensitive species
TMPO	Tahoe Metropolitan Planning Agency
TRPA	Tahoe Regional Planning Agency
TRT	Tahoe Rim Trail
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	United States Forest Service
USFWS	U.S. Fish and Wildlife Service
VMT	Vehicle Miles Traveled
VQO	Visual Quality Objective

Chapter 1 – Introduction

1.1 Document Structure

The U.S. Department of Agriculture (USDA) Forest Service (Forest Service) has prepared this environmental assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EA discloses the direct, indirect, and cumulative environmental effects that would result from the Proposed Action as well as the No Action Alternative. The document is organized as follows:

- **Chapter 1, "Introduction,"** includes information on the structure of the EA, background of the project, overview of the existing condition, the desired conditions, the purpose of and need for action, summary of the Proposed Action, applicable management direction, and the decision framework. This chapter also details how the Forest Service informed the public of the proposal through public involvement, describes the issues identified by the public, and summarizes laws, regulations, and policies that are applicable to the project.
- **Chapter 2, "Alternatives, Including the Proposed Action,"** provides descriptions of the No Action Alternative and the Forest Service's Proposed Action. Site maps of the project area are included. Chapter 2 also summarizes the effects of the No Action Alternative and the Proposed Action in tabular form.
- **Chapter 3, "Environmental Consequences,"** presents an overview of the analysis, the existing conditions, and the environmental effects of implementing the alternatives. The effects of the No Action Alternative are described first to provide a baseline for evaluation and comparison with the Proposed Action.
- **Chapter 4, "Consultation and Coordination,"** provides a list of preparers and agencies consulted during the development of this document.
- The **Appendices (A to D)**, include water quality protection best management practices, plan sheets, applicable mitigation measures from the 2015 Heavenly Master Development Plan Mitigation Monitoring Plan, and a list of projects considered in the cumulative effects analysis. Additional documentation may be found in the project record located at the Forest Supervisor's Office in South Lake Tahoe, CA.

1.2 Background

Heavenly Mountain Resort (Heavenly) is located in both California and Nevada, spanning three counties: El Dorado and Alpine in California, and Douglas County in Nevada. The Lake Tahoe Basin Management Unit (LTBMU) administers the majority of Heavenly's lift and terrain network on National Forest System (NFS) lands. The remainder of resort land is located on private lands owned by Heavenly. The NFS portions of Heavenly are administered under a 40-year ski-area special use permit (SUP) issued by the LTBMU on May 7, 2002. The SUP area encompasses approximately 7,020 acres of NFS lands. In total, the resort offers approximately 4,800 skiable acres, 29 lifts and 94 trails (runs). Heavenly has a base elevation of 6,540 feet and 7,200 feet in California and Nevada, respectively, and a summit elevation of 10,067 feet, with a total vertical elevation change of over 3,500 feet.

LTBMU adopted a new Land Management Plan (Forest Plan) in July 2016. The updated Forest Plan retains many of the designations and directions of the previous plan, including the General Conservation designation on the area affected by the Proposed Action (LTBMU Land Management Plan 2016, Map 1 – Management Areas).

Due to its unique location, activities at Heavenly are subject to extensive review and approval by various entities, including the LTBMU, Tahoe Regional Planning Agency (TRPA) Douglas County, El Dorado County, Alpine County, and numerous federal, state, and local agencies, laws, regulations, plans and policies.

Under the terms of the SUP, Heavenly is required to provide the Forest Service with a Master Development Plan to outline future projects and operations on NFS lands. A 20-year Master Plan was established in 1996, followed by a Master Plan Amendment in 2007 to address a change in ownership and general conditions at Heavenly Resort, updating the projects in the original plan to reflect current operating and environmental conditions and improved use balance. In 2015, Heavenly's Epic Discovery Project continued to implement the 1996 and 2007 Master Plan and addressed a 2011 amendment to the National Forest Ski Area Permit Act of 1986 supporting summer uses and year-round natural resource-based recreation at ski areas. Heavenly's 2007 Master Development Plan Amendment EIR/EIS/EIS and 2015 Epic Discovery Project EIR/EIS/EIS provide a framework and background for this EA.

Heavenly Mountain Resort's 2017 Capital Improvements Project includes ski trail widening and run hazard reductions, as well as associated snow making line realignments in accordance with Heavenly's approved Master Development Plan. All projects included in the Proposed Action are within Heavenly's Special Use Permit area (and more specifically within the LTBMU boundary), which is administered by LTBMU.

1.3 Proposed Action Summary

Heavenly Mountain Resort proposes maintenance activities on existing ski trails within the El Dorado and Toiyabe National Forests in the Lake Tahoe Basin Management Unit. The Proposed Action includes ski trail widening and run hazard reduction actions and associated relocation/realignment of some portions of existing snowmaking air and water pipelines to improve user experience, maintain user safety, increase energy and water efficiency, and maintain native species.

The trail widening prescription includes tree removal and select boulder relocation (in areas along the edges of existing trails where boulders were placed during original trail construction). Tree removal would be conducted over snow and skidded behind a snowcat over compacted snow. The trees would then be chipped and reused as mulch and soil amendment. Exposed boulders posing a safety hazard would be removed during the summer with excavators and placed in existing depressions along the edges of the widened trails. Trail widening is proposed on 12 trails, totaling 25.3 acres.

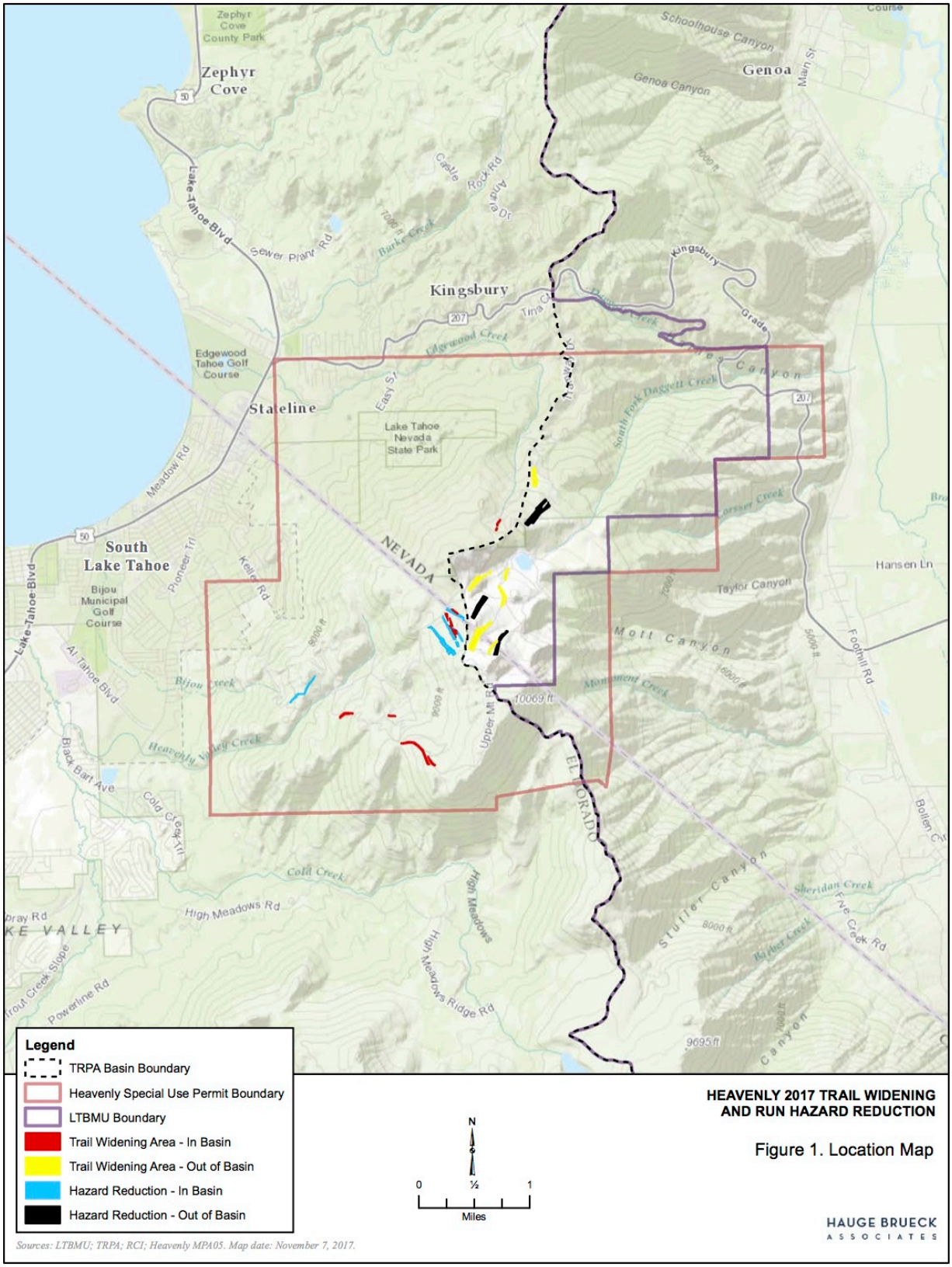
The run hazard reduction prescription was addressed in the Heavenly Ski Resort Master Plan and includes protection of native plants and revegetation, removal of invasive plants, chipping of large woody debris and existing felled trees, stump grinding, and boulder height reduction. Hazard reduction is proposed on eight runs, plus three runs where trail widening is proposed, totaling 41.9 acres.

In association with the trail widening and run hazard removal, the project would relocate or extend 5,800 feet of existing snowmaking pipeline infrastructure. Existing underground water and air lines used for snowmaking would be extended across the widened ski trails to align with the new edge of the trail and improve the efficiency of the snowmaking system. Lines would be placed approximately two feet below the ground surface and trenches would be no more than five feet wide. Trenches would be filled after placement of the lines.

A more detailed description of the Proposed Action, including design features can be found in Chapter 2 of this EA.

1.4 Location

This project is located on NFS lands within the LTBMU. It specifically includes select portions of the El Dorado and Toiyabe National Forests within the boundaries of the affected areas of Heavenly Mountain Resort, as depicted on Figure 1.


Zephyr Cove
Zephyr Cove County Park
Lake Tahoe Blvd
Sewer Plant Rd
Kingsbury
Kingsbury Grade
Edgewood Tahoe Golf Course
Stateline
Lake Tahoe Nevada State Park
Meadow Rd
South Lake Tahoe
Bijou Municipal Golf Course
Pioneer Trl
Kelley Rd
Al Tahoe Blvd
Bijou Creek
Black Bart Ave
Cold Creek Trl
Cold Creek
High Meadows Rd
Powerline Rd
Trout Creek Slope
Schoolhouse Canyon
Genoa
Genoa Canyon
Main St
Castle Rock Rd
Burke Creek
Edgewood Creek
Easy St
Daggett Creek
South Fork Daggett Creek
Lake Tahoe Nevada State Park
NEVADA
Taylor Canyon
Hansen Ln
Foothill Rd
Mott Canyon
Monument Creek
10069 ft
Upper Mill Creek
EL DORADO
Stutler Canyon
Sheridan Creek
Bryant Creek
Bolten Ct
High Meadows
Meadows Ridge Rd
9695 ft
Legend
TRPA Basin Boundary
Heavenly Special Use Permit Boundary
LTBMU Boundary
Trail Widening Area - In Basin
Trail Widening Area - Out of Basin
Hazard Reduction - In Basin
Hazard Reduction - Out of Basin
N
0
½
1
Miles
HEAVENLY 2017 TRAIL WIDENING AND RUN HAZARD REDUCTION
Figure 1. Location Map
HAUGE BRUECK ASSOCIATES
Sources: LTBMU; TRPA; RCI; Heavenly MPA05. Map date: November 7, 2017.

1.5 Purpose and Need for Action

The 2017 Capital Improvement Project Activities are linked, both directly and indirectly, to Heavenly's Master Development Plan (2015 MDP, page 1-11) the purpose of which is:

> *"to improve the overall quality of the visitor experience at the resort, creating an improved, multi-seasonal visitor and skier/snowboarder experience that is competitive with the experience offered by other destination resorts and that reflects current market trends and preferences." and "to modify and improve existing facilities for more efficient use."*

Heavenly and the Forest Service have identified an opportunity consistent with the LTBMU Forest Plan, the objectives of Heavenly's Master Development Plan, and the purpose of Heavenly's ski area special use permit to improve the quality of the existing facilities at Heavenly Resort. The objectives are to provide a higher quality recreation experience and more efficient management of the permitted lands at the resort while also reducing electrical energy and water consumption associated with snowmaking operations.

The desired condition is a high-quality public outdoor recreation experience for visitors to Heavenly in the winter season within the existing permitted area. There is also a desire to improve efficiency in operations and reduce resource use by conserving electrical energy and water usage in snowmaking. Achieving the desired conditions will be accomplished by modifying and improving the quality of existing facilities, including ski trails and snowmaking infrastructure.

There are identified locations on sections of key ski trails that, as a result of bordering forested areas, are not sufficiently wide enough to accommodate existing use levels and the desired flow of skiers and snowboarders during peak daily and seasonal periods. Greater skier density occurs on the identified trail segments and diminishes the guest experience. There is a need to widen those sections of ski trails by removing timber to promote better use of the permitted trails, and enhance guest enjoyment. A purpose of the Proposed Action is to improve the existing ski trail function and the identified issues by increasing the capacity of specific sections of existing ski trails by widening them which, in turn, will improve the recreation experience by reducing crowding and improving the flow of guests during periods of peak usage.

There are also a number of existing ski trails where downed logs, boulders, stumps and other obstacles were left in the trail as part of their original construction methods. Those obstacles limit the availability and use of the ski trails. These trails also require more snowmaking or natural snow to cover the obstacles so that the trails can be open and used by guests. Other ski trails that were constructed using modern techniques and do not contain these obstacles require less snowmaking or natural snow in order to operate.

Based on use levels and patterns, particularly in early-season and low-snowpack conditions, the trails are not providing a high-quality experience and cannot be opened on a consistent basis due to the presence of these obstacles. This requires more electrical energy and water for snowmaking in the early season and during periods of low natural snow in order to open and use the trails than other ski trails where the obstacles are not present. There is a need to remove the obstacles and relocate or realign snowmaking air and water lines to promote efficient use of electricity and water for snowmaking. An objective of the Proposed Action is to reduce the height of existing effective surface cover obstacles

(felled trees, large woody debris, stumps and boulders) to between 12 to 18 inches and to reduce electricity and water consumption associated with snowmaking to cover those obstacles.

The identified actions (remove timber to widen ski trails, remove obstacles, and relocate snowmaking infrastructure) are required to provide improved facilities for guest enjoyment for the winter sports purposes of Heavenly's ski area special use permit.

Additional objectives of the Proposed Action include maintaining the 70% total effective surface cover as required by the Cumulative Watershed Effects Analysis, providing a variety of surface cover for wildlife microhabitat, and conserving known Tahoe draba (and other sensitive plant species) populations.

1.6 Decision Framework

The LTBMU Forest Supervisor would decide:

1. Whether or not to implement the project activities as described in the Proposed Action.
2. Whether or not a Finding of No Significant Impact (FONSI) can be supported by the environmental analysis contained in this EA.

1.7 Public Involvement

The project was listed on the LTBMU's List of Projects and publically noticed on April 7, 2017. The public scoping notice was mailed to stakeholders and interested parties, requesting written and electronic comments on the Proposed Action by April 28, 2017. Nine responses were received between April 7 and May 1, 2017, including comments from the following agencies: California Regional Water Quality Control Board Lahontan Region, Nevada Department of Wildlife, Nevada Natural Heritage Program, and Nevada Division of Water Resources.

1.8 Issues

The Forest Service received nine comment letters in response to the public scoping notice published April 7, 2017, ranging from non-relevant issues to relevant issues. Some of the issues received, such as limiting ticket sales to manage congestion and user experience, and issues around charging fees for uphill skiing access, were deemed to be outside the scope of the Proposed Action. Some issues prompted clarification to the proposed action and project design features, such as concerns regarding summer trails management and the creation of snow surface scouring after tree removal. Other comments included concerns regarding the removal of whitebark pine, the removal of large trees, and impacts to visual resources that would result from trail widening activities. These comments prompted additional clarifications to the proposed action as to which areas would require removal of all trees (i.e., clear-cutting), and which portions proposed for trail widening would include selective tree removal and the retention of trees larger than 30" dbh where possible.

No issues were identified that served the purpose and need for the project, were relevant in the extent of geographic distribution, the duration of effects, or the intensity of interest or resource conflict that merited consideration of an additional alternative. The clarification of the proposed action to include feathering of tree removal along the edges of some trail widening areas and the retention of trees greater than 30"dbh adequately addresses the issues raised regarding tree removal, visual impacts, and whitebark pine conservation. The inclusion of an alternative that would reduce tree removal beyond

what is currently proposed was not considered because it would require the elimination of proposed trail widening areas and would not meet the purpose and need of the project. The current level of tree removal proposed is considered the minimal amount necessary to address the constrictions and skier conflicts that occur in this area, as well as the minimum required to provide an improvement in guest experience.

Scoping comments received, along with a summary of scoping comments report can be found in the project file.

1.9 Laws, Regulations, and Policies

All resource management activities described and proposed in this document would be consistent with applicable federal law and regulations, Forest Service policies, and applicable provisions of state law. The major applicable laws are as follows:

National Forest Management Act

The National Forest Management Act (NFMA) requires the development of long-range land and resource management plans. The LTBMU Forest Plan was approved in July, 2016 as required by this act. The Forest Plan provides guidance for all natural resource management activities. The NFMA requires that all projects and activities be consistent with the Forest Plan. The Forest Plan has been reviewed in consideration of this project, and the design of the Proposed Action is consistent with the Forest Plan. (Project Record, Sec. G: Management Direction)

Endangered Species Act

In accordance with Section 7(c) of the Endangered Species Act, the U.S. Fish and Wildlife Service (USFWS) list of endangered and threatened species that may be affected by projects in the Lake Tahoe Basin Management Area was reviewed (June 14, 2016).

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effect of a project on any district, site, building, structure, or object that is included in, or eligible for inclusion in, the National Register of Historic Places. Section 106 of the NHPA (Public Law 89.665, as amended) also requires federal agencies to afford the State Historic Preservation Officer a reasonable opportunity to comment. This project is consistent with the Programmatic Agreement between the Forest Service Region 5 and the Historic Preservation Officers of California and Nevada. (Project Record, Sec. B).

Clean Water Act (Public Law 92–500)

All federal agencies must comply with the provisions of the Clean Water Act (CWA), which regulates forest management activities near federal waters and riparian areas. The design features associated with the Proposed Action ensure that the terms of the CWA are met, primarily prevention of pollution caused by erosion and sedimentation.

California Environmental Quality Act (CA PRC § 21080)

The California Environmental Quality Act (CEQA) applies to discretionary projects to be carried out or approved by public agencies in California. The Lahontan Regional Water Quality Control Board (LRWQCB) process to grant a conditional waiver of waste discharge requirements on NFS lands is a discretionary act

subject to CEQA. Prior to approving a project, the LRWQCB must certify that: 1) the environmental document has been completed in compliance with CEQA; 2) that the Lahontan Water Board has reviewed and considered the information contained in the environmental document; and 3) that the environmental document reflects the Lahontan Water Board's independent judgment and analysis (Cal. Code Regs., Title 14, § 15090.)

Environmental Justice (Executive Order 12898)

Executive Order 12898 requires that all federal actions consider potentially disproportionate effects on minority and low-income communities, especially if adverse effects on environmental or human health conditions are identified. Adverse environmental or human health conditions created by the Proposed Action would not affect any minority or low-income neighborhood disproportionately.

Reviewing the location, scope, and nature of the proposed activity in relationship to non-federal land, there is no evidence to suggest that any minority or low-income neighborhood or community would be affected disproportionately. Conversely, there is no evidence that any individual, group, or portion of the community would benefit unequally from the Proposed Action.

Invasive Species, Executive Order 13112 of February 3, 1999

This EA covers botanical resources and invasive plants. An Invasive Plant Risk Assessment has been prepared (Project Record, Sec. B). The project's design features are designed to minimize risk of new invasive plant introductions.

Migratory Bird Treaty Act of 1918 as amended (16 USC 703-712)

The original 1918 statute implemented the 1916 Convention between the United States and Great Britain (for Canada) for the protection of migratory birds. Later amendments implemented treaties between the United States and Mexico, Japan, and the Soviet Union (now Russia). Specific provisions in the statute include the establishment of a federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird." Because forest lands provide a substantial portion of breeding habitat, land management activities within the LTBMU can have an impact on local populations.

A Migratory Bird Report (Project Record, Sec. B) has been prepared for this project which fulfills the requirements of this act and Executive Order 13186.

Architectural Barriers Act

The Architectural Barriers Act (ABA) requires that facilities designed, built, altered, or leased with funds supplied by the United States federal government be accessible to the public. The ABA provides uniform standards for the design, construction, and alteration of buildings so that persons with disabilities would have ready access to and use of them. These standards are incorporated into the design of this proposed action in order to meet the ABA.

Tahoe Regional Planning Agency (TRPA)

Management activities under this proposed action would be reviewed by TRPA consistent with the terms of the 1989 Memorandum of Understanding between TRPA and the Forest Service. Depending on the extent of project activities, project permits may be required as discussed below.

1.10 Permits and Coordination

Tahoe Regional Planning Agency

- Project Permit – TRPA has issued a project permit for the Proposed Action, TRPA File Number ERSP2017-0015.

- Grading Permit/Grading Exemption - There are grading standards set forth in TRPA Code Chapters 30 and 33. Limitations include no excavation, filling, or clearing of vegetation or other disturbance of the soil between October 15 and May 1 of each year, unless TRPA and Lahontan grant approval. Grading schedule standards are established in Section 33.5 of the Code. A grading schedule is required by TRPA prior to approval and project construction.

Lahontan Regional Water Quality Control Board

- Conditional Waiver of Waste Discharge Requirements for Waste Discharges Resulting for Timber Harvest and Vegetation Management Activities in the Lahontan Region "2014 Timber Waiver" – Board Order R6T-2014-0030, Section D, details the category-specific eligibility criteria and conditions for activities regulated by the Timber Waiver. A Category 4 (activities that rely on existing roads and meet 11 criteria, and may include winter-period operations) Application Form will be submitted for coverage of the tree removal component of the proposed action. Activities that may proceed under Category 4 must meet the following eligibility criteria:

    (1) No construction of new temporary or permanent roads.

    (2) No widening of watercourse crossings or road surfaces.

    (3) No construction of new watercourse crossings except for the construction of over-snow watercourse crossings.

    (4) The use of up to one crossing of a dry Class III watercourse per 1⁄4 mile of stream length that does not disturb the bed or banks of the stream channel. Prior to use operable (as defined in Attachment A) soil conditions must exist and the crossing shall be passable by standard production 4-wheel drive vehicles without any grading or excavation of the stream bed or banks or crossing approaches.

    (5) No tractor, vehicle, or equipment operations within SEZs (as defined in Attachment A) or WBBZs (as defined in Attachment B), except for:

        (a) Use and maintenance of existing roads and crossings;

        (b) Up to one crossing of a dry Class III watercourse per 1⁄4 mile of stream as described in Criteria 4, above;

(c) Use of equipment with ground pressures less than 13 psi at distances greater than 25 feet from a waterbody, when soils are operable;

(d) When snow depth is sufficient to not allow visible disturbance of soils or

(e) When hard frozen conditions exist (as defined in Attachment A)

(6) No mechanical site preparation (as defined in Attachment A).

(7) No activities on slopes greater than 60%, except for aerial or cable operations.

(8) No tractor, vehicle, or equipment operations on slopes greater than 50%.

(9) No construction of new skid trails on slopes greater than 40%, except over-snow operations.

(10) No construction of landings requiring earthwork (i.e., grading or excavation) on slopes greater than 20% within 200 feet of a watercourse and where there is potential for sediment delivery to a waterbody due to soil disturbances.

(11) No tractor, vehicle, or equipment operations on soils with high or extreme erosion hazard rating, known slides, or unstable areas, except over-snow operations.

- Construction General NPDES Permit for the Lake Tahoe Basin – The Proposed Action will create over 1 acre of temporary disturbance associated with staging and access areas, minor grading for trail widening and run hazard reduction, and snowmaking pipeline relocation on the California-side of Heavenly. Projects with construction activities disturbing greater than one acre in California must apply for coverage under (Board Order R6T-2016-0010, prepare a Notice of Intent (NOI) and implement a Stormwater Pollution Prevention Plan (SWPPP). BMPs must be installed and maintained throughout project construction to avoid adverse impacts to receiving water quality as defined by Chapter 5 of the Lahontan Basin Plan. Upon completion of the Project, Heavenly must submit a Notice of Termination (NOT) to Lahontan to indicate that construction is completed.

- Waster Discharge Requirements Board Order R6T-2015-0021 – Compliance with Heavenly's updated discharge permit satisfies the water quality requirements of the Lahontan and the State of California

USDA Forest Service Lake Tahoe Basin Management Unit

- Decision Notice and Finding of No Significant Effects (FONSI) - The Decision Notice must either contain a Finding of No Significant Impact (FONSI) on the human environment or refer to a FONSI. The FONSI is a brief document of a Federal agency finding and reasons why an action will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared. The Forest Service typically includes the FONSI as part of the Decision Notice. A FONSI needs to include the Environmental Assessment (EA) or a summary of it. The content of the Decision Notice and summations of the environmental effects analysis (with citations to the EA in the FONSI) typically provide the information to summarize the EA. Forest Service FONSIs typically closely follow the definition for "significantly" from the Council on Environmental Quality regulations, citing the intensity factors at 40 CFR 5108.27. Support for the findings of no significant impact is provided in the Environmental Assessment.

Chapter 2 - Alternatives, Including the Proposed Action

2.1 No Action – Alternative 1

Under the No Action Alternative, current conditions and management would continue. This alternative would result in no trail widening, run hazard reduction activities or realignment of snowmaking air and water pipelines, and as a result, would not implement the prescriptions established in the Heavenly Ski Resort Master Plan. Ski Trails would remain in their current condition.

2.2 Proposed Action – Alternative 2

The Proposed Action consists of trail widening to address areas of existing skier congestion, the removal of run hazards such as large boulders, downed trees, and other large natural debris, and the associated realignment of snow making water and air pipelines. The Proposed Action, including Tahoe draba avoidance areas, is depicted on the plan sheets in Appendix B.

Tables 2 and 3 identify the ski trail widening and run hazard reduction areas, respectively. Both ski trail widening and run hazard reduction (in the areas where trail widening are proposed) would occur on the following ski trails: Sam's Dream, 49er, Cascade, Ridge Run, Powderbowl, and Olympic Downhill.

2.2.1 Existing Ski Trail Widening

Heavenly's Master Development Plan envisions widening some of the approximately 719 acres of existing ski trails throughout the resort. The Proposed Action would selectively widen the ski trails listed in Table 1 to achieve more consistent trail widths that respond to its use levels, and eliminate bottlenecks along the trails that affect skier flow.

Table 1. Ski Trail Widening Locations

Run	Area (acres)
49er (IW-1)	0.3
Sam's Dream (IW-2)	1.2
Cascade (IW-3)	0.3
Ridge Run (IW-4)	2.9
Upper Powderbowl (IW-5)	1.0
Ridge Way (IW-6)	0.3
Lower $100 Saddle (IW-7)	0.5
Comet (OW-1)	3.3
Orion's (OW-2)	10.9
Big Dipper (OW-3)	1.2
Lower Olympic Downhill (OW-4)	3.2
Bonanza	0.2
Total	*25.3*

Note: Comet, Orion's, Big Dipper, Lower Olympic Downhill and Bonanza area located outside the Lake Tahoe Basin Boundary.

The edges of certain trail widening areas will be feathered where possible in order to retain large diameter trees (greater than 30" dbh), and provide visual and experiential benefits to the user. The feathering will be laid out as part of the final field review and tree marking with the Forest Service prior to removal. In trail widening areas closest to the existing ski trail, all trees will be removed. In the areas where feathering is proposed, all trees less than 30 inches dbh will be removed and some or all of the trees greater than 30 inches dbh would be retained. Figures 2 through 5 are photographs that document the existing conditions of several proposed trail widening locations.

Lower Orion's and Lower Olympic Downhill would require grading to match the widened area to the grade of the existing ski trail. Grading spoils would be spread on the adjacent ski trail, stabilized and revegetated per the specifications in the engineering plan set. Widening proposed for Ridge Run would expand the skiable boundary, but would be located within the existing Special Use Permit Boundary.

Six temporary staging areas would be established for ski trail widening activities, ranging in size from approximately 0.5 to 1 acre in size. No tree removal or grading would occur in the staging areas. These staging areas are shown on the Plan Sheets and are generally located in the following areas: near the top of the Gondola, at Ridge Bowl and Maggie's near the Canyon Express lift, at the top of the Powderbowl Express lift, near the Gunbarrel Express lift and Groove and Patsy's lifts, near $100 Saddle and the Olympic Express lift, and at the top of the Dipper Express lift near the Comet Express lift off an existing summer road. Fiber rolls would be installed and maintained at the downstream edge of the staging areas during construction.

Figure 2. Proposed Trail Widening along Olympic "S Curves" (Watershed NV-5)

Figure 3. Proposed Trail Widening along Orion's Run (Watershed NV-1)

Figure 4. Proposed Trail Widening along Big Dipper Run (Watershed NV-1)

Figure 5. Proposed Trail Widening along Ridge Run (Watershed CA-1)

2.2.2 Run Hazard Reduction

Due to the topography and geology throughout the resort as well as previous ski run construction methods, large boulders and downed trees are found within existing developed ski runs, which presents a challenge to opening and maintaining terrain for skiing and riding each season. The height of these natural features can require up to five feet or more of snow coverage before runs can be opened. During low snow years, a great deal of energy and water resources for snowmaking is required to provide enough snow on these trails so that they can be safely opened. Two ski trails, Advanced Round-a-bout and Meteor, do not have snowmaking infrastructure and are not able to be opened during low snow years due to the existing hazards.

The Run Hazard Reduction Prescription will be implemented on sections of the ski trails listed in Table 2. Figures 6, 7, and 8 illustrate some of the existing hazards that would be removed or reduced under the proposed treatment methods. This prescription would reduce obstacles and allow improved surface coverage under natural and manmade snow conditions. Boulders would be capped (blasted with explosives) to a height of 12-18 inches and moved by hand or equipment. Stumps would be ground or cut to a height of less than 6 inches but would remain in place. Large diameter logs would be moved from the ski trail, chipped or used along steeper sections of the trail for erosion control. Finally, all existing limbs would be chipped or lopped and scattered to a height of between 12-18 inches. Felled trees would be chipped and used as mulch. Because of identified impacts to existing Tahoe draba populations as outlined in Section 3.4, the areas proposed for Run Hazard Reduction treatment will be reduced for Upper California Trail (IH-1), Cascade (IH-2) and Ridge Run (IW-4) .

Table 2. Run Hazard Reduction Locations

Run	Proposed Area (acres)	Mitigated Area (acres)
Upper California Trail (IH-1)	7.3	3.35
Cascade (IH-2)	3.5	3.49
Sam's Dream (IH-3)	2	2
49er (IH-4)	2.4	2.4
Advanced Round-a-bout (IH-5)	3.3	3.3
Little Dipper (OH-1)	4.9	4.9
Upper Stagecoach (OH-2)	8.1	8.1
Meteor (OH-3)	3.3	3.3
*Ridge Run (IW-4)	2.9	2.89
*Upper Powderbowl (IW-5)	1.0	1.0
*Lower Olympic Downhill "S Curves" (OW-4)	3.2	3.2
Total	*41.9*	*37.93*

Note: Little Dipper, Upper Stagecoach and Meteor area located outside the Lake Tahoe Basin Boundary.

*Minor run hazard reduction activities (e.g., boulder removal or capping) would also occur on Ridge Run, Powderbowl, and Olympic downhill within the proposed trail widening areas.

Figure 6. Proposed Run Hazard Reduction within Cascade (Watershed CA-1/In-Basin)

Figure 7. Proposed Run Hazard Reduction within 49er and Sam's Dream (Watershed CA-1/In-Basin)

Figure 8. Proposed Run Hazard Reduction within Meteor (Watershed NV-1/Out-of-Basin)

On Ridge Run (IW-4), Powderbowl (IW-5), and Olympic Downhill (OW-4), the Project would blast or remove the existing surface boulders previously placed on these trails during original ski trail construction, and stumps would be flush cut if needed following snow melt. Since there is generally no tall undergrowth on these trails, no additional run hazard treatment would occur. The tree island on Stagecoach (OH-2) will be retained, as will any boulders or woody debris within that tree island.

Removing these existing hazards would save some of the electrical energy and water currently used for snowmaking because the necessary depth of snow currently needed to avoid these hazards would be reduced. Table 3 calculates the current and projected water and energy demand for snowmaking on these trails. As shown in the table, total annual water and energy savings are estimated to be 10.9 million gallons and 365,000 kilowatts, respectively, which is a savings of approximately 30 percent on these trails.

Table 3. Water and Energy Use, Projections, and Savings							
		Current Demand		Projected Demand		Projected Savings	
Run	Acres	Gallons (millions)	Kilowatts	Gallons (millions)	Kilowatts	Gallons (millions)	Kilowatts
Little Dipper	4.9	5.10	206,949	3.57	144,864	1.53	62,085
Upper CA Trail	7.3	7.59	308,311	5.31	215,818	2.28	92,493
Cascade	3.5	3.64	147,820	2.55	103,474	1.09	44,346
Sam's Dream	2	2.08	84,469	1.46	59,128	0.62	25,341
49er	2.5	2.6	105,586	1.82	73,910	0.78	31,676
Meteor	3.3	3.43	139,374	2.40	97,561	1.03	41,812
Upper Stagecoach	8.1	8.42	8,5007	5.9	59,505	2.53	25,502
Advanced Roundabout	3.3	3.43	139,374	2.40	97,561	1.03	41,812
Total	*34.9*	*36.30*	*1,216,889*	*25.41*	*851,822*	*10.89*	*365,067*

Source: Heavenly Ski Resort, 2017

2.2.3 Snowmaking Pipeline Realignment

As a result of the trail widening, existing buried snow making water and air pipelines would be extended to the new edge of the trail in the widened areas. The Project would relocate or extend 5,800 linear feet of snowmaking infrastructure. Lines would be placed approximately two feet below the ground surface and trenches would typically be 3 feet wide and no more than five feet wide. Snowmaking pipeline realignment or extension would occur along the trails listed in Table 4. Figure 9 illustrates a recent snowmaking line relocation project and resultant slope and effective soil cover along Stagecoach Run on the Nevada-side of Heavenly. Field surveys conducted on August 2, 2017 identified no new areas of chronic erosion. As documented during past effective soil cover monitoring, it is anticipated that native ground vegetation, specifically shrubs, will reestablish over time as long as soils are stabilized.

Table 4. Snowmaking Pipeline Realignment or Extension Areas			
Ski Trail	**Action**	**Linear Feet of Pipe**	**Disturbed Area (square feet)**
Cascade	Approximately 1,600 linear feet of the air and water lines currently located above ground in the center of the run will be moved to the edge of the run and buried as part of the Run Hazard Reduction Treatment. The trench would measure 1,600 ft. by 3 ft. This action is below the location of Tahoe draba occurrence.	1,600	4,800
Big Dipper	10 laterals, each measuring approximately 75 feet in length would be added to the existing laterals. These lateral extensions would connect to the existing lateral end and be placed below ground in a 3-foot wide trench.	750	2,250
Ridge Run	15 laterals, each measuring approximately 100 feet in length would be added to the existing laterals. These lateral extensions would connect to the existing lateral end and be placed below ground in a 3-foot wide trench.	750	2,250
Comet	12 laterals, each measuring approximately 50 feet in length would be added to the existing laterals. These lateral extensions would connect to the existing lateral end and be placed below ground in a 3-foot wide trench.	1,200	3,600
Lower Orions'	8 laterals, each measuring approximately 75 feet in length would be added to the existing laterals. These lateral extensions would connect to the existing lateral end and be placed below ground in a 3-foot wide trench.	600	1,800
Lower Olympic Downhill	6 laterals, each measuring approximately 150 feet in length would be added to the existing laterals. These lateral extensions would connect to the existing lateral end and be placed below ground in a 3-foot wide trench.	900	2,700
	Total	5,800	17,400

The existing aboveground air and water lateral lines on Cascade will be reused and buried at the same time that run hazard reduction work is completed. Existing lateral lines on the runs to be widened will generally remain in place and will be extended with a new length of pipe added to the end of the existing lines. The existing hydrant vertical pipes will be disconnected from the existing connection and reconnected to the new end of the lateral line.

Figure 9. Example of Relocated Underground Snowmaking Line on Stagecoach Run (NV-5/Out-of-Basin)

The Proposed Action would not affect existing buildings or other structures, other than those portions of the buried snowmaking lines that are to be realigned.

2.3 Project Design Features

Project design features are elements of the project that are applied in implementation. These features are developed based on Forest Plan direction and site specific evaluations in order to reduce or avoid negative impacts of the proposed action activities. The following design features and construction methods would be utilized under the Proposed Action as appropriate. These measures are taken directly from the Master Development Plan Construction Erosion Reduction Program. In addition, applicable mitigation measures from the Heavenly Mountain Resort Master Development Plan Mitigation Monitoring Plan (Appendix C) would be implemented. Specific design features include:

- Install temporary water quality Best Management Practices (BMPs) as needed. These may include but will not be limited to: silt fences, straw wattles, coir logs, mulching, gravel/sand bags and construction fencing.
- Limit disturbance and the number of construction staging areas.
- Limit tree removal to minimum amount necessary, including white bark pine where present.
- Utilize over-the-snow tree removal and skidding in areas of known Tahoe draba or habitat. In other areas utilize over the snow tree removal and skidding when possible. Trees may be dropped when there is no snow and then removed over snow at a later time. During over-the-snow tree removal, trees will be skidded over a minimum of 12" of compacted snow behind a snow cat to designated staging areas in order to prevent soil disturbance. Trees will be limbed and chipped at the staging area or on-site for use for erosion control and soil amendments.
- Apply an EPA registered borax compound to cut stumps according to Regional policy and recommended guidelines to limit the likelihood of heterobasidion root disease.
- The Run Hazard Reduction Prescription will not be implemented in areas where Tahoe draba have been found. Currently, surveys have not located any in the areas proposed for this treatment.
- No areas of mapped archaeological features will be used. Off-limits areas will be identified and established jointly by Heavenly and Forest Service staff near these sensitive areas and lined with rope barriers in order to prevent access.
- Backfill and compact all excavations.
- Separate top soil and duff layers from excavation spoils for later re-use in revegetation where possible.
- Implement site-specific revegetation, erosion control and sedimentation plans and specifications.
- Seed used for revegetation will be approved by the LTBMU before purchase.
- Incorporate organic material into soil amendments to promote soil infiltration and plant establishment where necessary.
- Implement invasive plant species control and prevention measures.
- Implement permanent water quality BMPs following project construction.
- Re-establish vegetation and soil function capacities at staging areas following project completion.
- Utilize dust control measures, at construction sites and on roads.
- Use US EPA Tier 2/Tier 3 level engines and power units to minimize emissions.
- Conduct multi-year, post-construction monitoring and reporting of construction areas as required by the Forest Service BMP Effectiveness Protocol Program.

2.3.1 Trail Widening Prescription

The Trail Widening Prescription includes the following:

1. Trail widening shall consist of tree removal and select boulder relocation.

2. All tree removal shall be conducted over snow.

3. Trees shall be skidded behind a snowcat over a minimum of 12-inches of compacted snow to a staging area as shown on the plans.

4. Removed trees shall be limbed and chipped at the staging area for use as mulch and soil amendment.

5. Trees to be removed (over 6-inches in diameter dbh) will be flagged in the field.

6. Low lying vegetation shall be left undisturbed and protected to the greatest extent practicable.

7. Large boulders along the edge of the existing trails within the widening areas may be relocated or capped to minimize the obstructions to skiers and grooming equipment. Boulders shall be removed through the use of an excavator and replaced in existing depressions along the ski trails. Boulders that cannot be removed will be capped. Boulder relocation shall occur in the summer.

8. Where present in usable quantities, existing topsoil or organic material shall first be removed and stockpiled for later use in revegetation of areas disturbed or compacted by heavy equipment. Achieve 70% effective soil cover over areas disturbed as a result of this project.

9. Existing snowmaking water and air lines noted for realignment will be removed using an excavator. Snowmaking lines realignment will occur during the summer.

10. All areas disturbed due to excavator movement shall be ripped to a minimum depth of 12-inches and mulched with a pine needle mulch to a minimum depth of 2-inches.

2.3.2 Hazard Reduction Prescription

The Hazard Reduction Prescription as included in the Heavenly Ski Resort Master Plan includes the following practices and prescriptions to be implemented:

Prescriptions

Prescription 1: Protect Native Plants and Revegetate

- Existing native shrubs in the treatment areas will be field identified and avoided to the greatest extent possible.

- Within the snowmaking construction corridor, revegetation activities will be completed as planned.

Prescription 2: Remove Noxious Weeds

- Noxious weeds shall be flagged by a qualified Heavenly representative or consultant, isolated from project activity, and reported to the Lake Tahoe Basin Management Unit's (LTBMU) Ecosystem Conservation Department for formal taxonomic identification and removal activity scheduling.

Prescription 3: Chip Existing Felled Trees and Large Woody Debris

- All existing limbs shall be either chipped and spread evenly or scattered where the maximum height does not exceed 12 to 18 inches.
- ·Existing felled trees that are chipped shall result in a mulch evenly distributed to an average depth of three inches.

Prescription 4: Treat Existing Large Diameter Logs

- Large diameter logs cannot be mechanically chipped and will be treated separately as described below:
    - Existing large diameter logs shall be removed from the run with excavator on site for snowmaking construction.
    - Logs shall be placed in adjacent forested areas off of the designated ski run to mimic natural surroundings.
    - Logs along steeper sections will be mechanically placed perpendicular to the slope where needed to reduce soil erosion hazards.

Prescription 5: Grind Existing Tree Stumps

- Stumps shall not be removed and soil disturbance will not occur.
- Stumps shall be cut or ground to less than 6 inches in height from the soil surface whenever safely possible.

Prescription 6: Reduce Height of Boulders

- Boulders shall be capped (blasted with explosives) to a height of 12 to 18 inches.
- Boulders will be moved by hand whenever possible, but the excavator onsite for the snowmaking installation may also be utilized.
- Fragments shall be placed as to maximize contact with the soil surface with efforts to mimic the natural surroundings.

<u>Improving Soil Resources</u>

- Rather than simply spreading the wood chips or other organic material on top of the soil, use aged organic material to blend into the onsite soil when possible based on site constraints; and
- When using the aged material is not possible, till wood chips into the onsite soil rather than spreading them over the top of the soil.

<u>Improving Wildlife Habitat</u>

- Leave all shrubs and groundcover that are 18" in height or less on the run.
- Plant native shrub or groundcover seedlings in certain areas where they are most likely to survive that mimic the surrounding shrub and groundcover populations where possible in order

to encourage plant establishment and provide shelter for rodents (this technique will also provide water quality benefits).

- Leave some areas of bare soil in order to serve as seed caches for rodents and birds.
- When placing rock on the slope, create pockets within groups of rock and create rock ledges with overhangs in order to provide refuge for rodents and small mammals.
- Rocks that are capped should have any removed pieces that are intact left on the run and arranged in such a manor that leaves overhangs and other spaces for wildlife shelter.
- Provide variety of higher heights of rock, not simply the minimum height of 12 inches (this technique will also provide visual quality benefits).
- Logs equal to or less than 18" diameter will be trimmed of branches so that all branches that are lower in height than the diameter of the log remain in order to provide micro-scale habitat for rodents and small mammals.
- Logs between 12" and 18" diameter should be present in densities at or greater than the surrounding forest or no less than 10 logs per acre, whichever is greater.
- Logs should be aligned across the slope on the ground surface or removed to the staging area.
- Logs greater than 18" in diameter shall be moved to the edge of the run and aligned across the slope so that the portion of the log that is 18" or less in diameter is left within the run or removed to the staging area.
- In some cases, it may be desirable to leave larger diameter logs in place in the run (up to 24" diameter). In those cases, the prescriptions may be modified to account for larger diameter logs left and different amounts of logs per acre that will be left in the run.

Improving Visual Quality

- Randomly feather logs placed across the slope from the cleared run into the edges of the adjacent forested area in order to add visual variety and avoid uniform log placement.

Incorporating Underground Utilities

- ·Do not create longitudinal depressions or troughs that can serve as conduits for surface water runoff when installing underground utilities and/or removing large volumes of soil or rock which results in a significant alteration of the slope shape.

Construction Techniques

- Select the optimum pieces of equipment given the site conditions to achieve the hazard reduction objectives while minimizing unwanted environmental effects.
- Consider timing of the work relative to soil moisture, soil compaction potential, the ability to deliver equipment or materials to an unroaded slope while snow pack still exists.
- Combine slope hazard reduction work with other tasks such as snowmaking installation in order to complete the work with one entry.

2.3.3 Erosion Control

In addition to the erosion control features described above, the following would be implemented during construction:

1. For all use of the staging area when snow cover is not present, Heavenly shall have all temporary erosion control measures in place and approved by TRPA. Heavenly shall incorporate adequate drainage procedures during the construction process to eliminate excessive ponding and/or erosion. After a rainstorm in which runoff occurred, all silt and debris must be removed from temporary erosion control measures, and any damaged erosion control measures must be repaired.

2. An onsite inspection by TRPA staff is required prior to any construction or grading activity. TRPA staff shall determine if the onsite construction temporary erosion control measures have been properly installed. No grading or construction shall commence until TRPA pre-grade conditions of approval are met.

3. Heavenly shall be responsible to install and maintain all temporary erosion control measures to ensure proper working conditions. Roads used during construction will be inspected daily by Heavenly for drainage and grading. Ruts will be repaired immediately. Waterbars, culverts, and ditches (drainage structures) will be maintained on a daily basis during construction.

4. Sediment barriers and construction limit fencing will be inspected daily during construction by Heavenly personnel for damage and appropriate placement. Sediment barriers shall be repaired and/or relocated as needed on a daily basis.

5. Temporary BMP measures shall be installed in all shallow bury snowmaking pipe locations.

6. Excavation shall not exceed 5-feet below ground surface.

7. Disturbed areas, roadways, and staging areas used during construction shall be swept (if paved) and provided with dust abatement such as a water truck as needed.

8. For all native trees to remain, temporary construction fence shall be installed around the dripline of all trees adjacent to the road and work areas, where feasible, or other measures deemed appropriate by the TRPA inspector.

9. Heavenly shall be responsible for maintaining the site in a neat and orderly manner throughout the construction process.

10. The log staging area will be minimized and delineated with project boundary fencing whenever snow cover is not present.

11. Turning or maneuvering of backhoe, excavator or other equipment will be minimized to reduce soil disturbance.

12. Construction traffic off of the existing roads will be limited to one excavator and snowcats for tree removal and boulder replacement.

2.3.4 Revegetation

All areas disturbed during construction, including access corridors, storage areas, staging areas, and construction areas shall be stabilized according to these specifications. Upon completion of grading and construction, and prior to revegetation, all areas to be revegetated will be inspected by the engineer's

revegetation specialist (RS). Final seeding and mulch treatment areas will be staked in the field at that time. Stabilization treatments shall consist of wood chip incorporation into the top 12 inches of soil, seeding, and pine needle/wood chip mulch application to a loose depth of 2 inches.

Seed mixtures are shown in Table 5. Seed shall be clean new crop seed, purchased premixed on a pure live seed (pls) basis and approved by the USFS LTBMU before purchase. Seed shall be delivered to the site in original unopened containers bearing the dealer's guaranteed analysis and germination percentage, and shall meet the state of Nevada freedom from noxious weed requirements for areas to be revegetated within Nevada. No substitutions in the seed mixture will be accepted without written approval. Seed labels shall be removed from the seed sacks at the time of seeding. Seed labels will include documentation for each type of seed certifying that a recognized laboratory tested the seed within 6 months of the date of delivery.

Table 5. Revegetation Seed Mix

Description	**Seeding Rate of Pure Live Seed (Pounds Per Acre)**
Manzanita Greenleaf	0.5
Brome California Sierra	12
Wheatgrass Slender Revenue	13
Wheatgrass Thickspike Critana	5
Fescue Idaho	3
Squirreltail	6.5
Bluegrass Big Sherman	1
Needlegrass Western	0.5
Wildflower Heavenly Custom Mix	2
Sagebrush Big Mountain	1
Bitterbrush	1
Total Rate	*45.5*

Wood chips shall be prepared from trees removed during construction and maintenance activities on heavenly mountain resort. Tops and branches of trees removed on this and other Heavenly Mountain Resort project sites will be chipped to a minimum diameter of 2 inches, and a maximum length of 6 inches.

Pine needles salvaged from the construction site or from other sources near the project area or within the Lake Tahoe Basin can be used as a mulch material. Pine needle mulch shall be weed free and clean without debris, or excessive woody material.

All areas to be seeded shall be loosened to a depth of at least 12 inches to alleviate compaction and to incorporate wood chips to improve water infiltration and water holding capacity. A uniform 3-inch layer of wood chips shall be spread across the surface of the treatment areas. Wood chips shall be incorporated into the top 12 inches of soil by an approved loosening method. Areas shall be raked smooth following wood chip incorporation.

Areas designated for seeding shall be uniformly broadcast seeded with hand operated broadcast seeders. The contractor shall provide a written statement or site demonstration to verify that the seeding broadcast equipment has been calibrated to the specified application rates. Seeding shall not occur under conditions that would allow seed to become wind born. Seed shall not be incorporated and applied with hydromulch. Immediately following broadcasting, the seeded areas shall be lightly hand-raked to place the seed at depth of ¼ to ½ inch into the soil. No further vehicular access will be allowed on treatment areas upon completion of seeding. Seedlings shall not be left overnight without receiving mulch treatment.

All seeded areas shall be mulched with pine needles or wood chips. Pine needle mulch shall be spread across seeded areas in a loose 2-inch layer to achieve a minimum of 90 percent cover.

2.3.5 Tahoe Draba Avoidance Plan

Surveys for Tahoe draba (*Draba asterophora var. asterophora*) were performed by Lake Tahoe Basin Management Unit Botanists and Hauge Brueck Associates Biologists. Plants were located near the Tamarack Express upper terminal. In order to avoid and protect the existing plants the following measures shall be taken:

- The in-basin project polygons shall avoid direct impacts to Tahoe draba on portions of IH-1 (California Trail – 3.95 acres), IH-2 (Cascade – 0.01 acres) and IW-4 (Ridge Run – 0.01 acres). The proposed project shall avoid these known occurrences and reduce the project areas accordingly so as to avoid direct impacts to Tahoe draba.

- The out-of-basin polygons OW-2 (Orion – 0.07 acres) and OH-3 (Meteor – 0.07 acres) shall avoid impacts to Tahoe draba through the inclusion of exclusion zones around the known occurrences to protect the individuals. The existing mitigation measure 7.5-16 Protect Tahoe Draba Populations within Heavenly Mountain Resort (2015 Master Development Plan), require the use of fencing around known populations to protect Tahoe draba to be four feet in height and readily identifiable by construction crews.

- All facilities that are proposed to be located within potential Tahoe draba habitat shall have surveys performed prior to site planning for the facility. All in-basin Tahoe draba plants shall be avoided and protected using protective measures identified below for in-basin projects.

- For out-of-basin projects and for in-basin projects as outlined below, minimize loss of Tahoe draba plants by installing protective fencing around occupied habitat that is adjacent to Forest Service approved projects. Fencing shall be installed prior to the onset of construction, shall be at least 4 feet in height, and shall be installed along the boundary of any construction zone, staging areas, or roads and trails that will be used for construction access and are located adjacent to existing Tahoe draba plants. Plants located within the approved construction footprint may be disturbed for out-of-basin projects only. Fencing will be maintained throughout the duration of construction activities and removed upon completion of the project and prior to the opening of the ski season. Installation of information signs and working education shall also be required to inform construction crews of the purpose of the fencing.

- For in-basin projects, avoid loss of Tahoe draba by siting facilities away from Tahoe draba populations and by installing protective fencing around occupied habitat where it is adjacent to proposed facilities.

- Construction activities should avoid capping rocks/boulders that have Tahoe draba growing near them. If rocks must be capped near Tahoe draba populations, existing plants shall be covered during blasting with canisters or other approved protective measures. This measure is in addition to the fencing described above.

- Fences and blasting operations near Tahoe draba plants shall be monitored for the duration of the construction season by contractors, Heavenly staff, and Forest botanists to ensure compliance.

- Develop and implement an employee orientation and training program for Tahoe draba for those employees associated with summer operations, such as interpretive programs, zip line, and hiking trails. Interpretive materials may include a description or illustration of Tahoe draba, an overview of the plant's natural history, general location of the species at Heavenly, and measures that could be employed to protect the plant and its habitat from disturbance. Interpretive materials and services should be provided at entry points for summer visitors to the resort.

2.3.6 Cultural Resource Best Management Practices

Any previously unidentified archaeological remains discovered or exposed during project implementation will be afforded full protection, including stopping work and roping off the area. Upon discovery of previously unidentified archaeological remains, the Forest Service will be immediately notified. Work will not proceed until authorized to proceed by the authorized officer.

2.3.7 Recreation Safety Practices

To maintain recreation user safety during construction activities, the following practices will be implemented:

- During hazardous activities such as blasting or relocation of the snowmaking infrastructure that requires heavy vehicles, recreational access on trails will be closed and appropriate “Construction Zone” warning signage and staff would be provided to direct visitors during the closure.

- If over snow tree removal occurs during the ski season, the affected area and adjacent ski trails will be closed to public entry until tree removal activities have been suspended or are completed.

2.3.8 Rock Busting Noise Minimization Practices

Heavenly Mountain Resort’s adopted Heavenly Master Development Plan, Mitigation and Monitoring Plan includes rock busting noise mitigation methods that are to utilized during operations. Measure 7.5-12 is implemented to mitigate the impact of the noise to a less than significant level by controlling the number, size and location of “rock busting” blasts to meet noise standards:

1. Rock busting operations noise impacts have been thoroughly analyzed in the 95 Draft EIR/EIS/EIS Noise Section 4.6, and are described above. It is expected that additional rock busting operations will occur as a part of the continued development of the Master Plan. In order to reduce this impact to less than significant, existing mitigation measures for rock busting shall continue to be implemented to reduce on mountain rock busting noise.

2. The noise levels vary based upon shot size and shot timing. Based upon the analysis in the 95 Draft EIR/EIS/EIS, locations of the 50 dB and 55 dB C-weighted CNEL contours are about 2,900 feet and 1,800

feet, respectively, from the blast site. In order to reduce this impact to less than significant, existing mitigation measures for rock busting shall continue to be implemented to reduce on mountain rock busting noise.

Audible noise due to blasting is not commonly considered to be a significant source of annoyance if blasting is controlled to meet safety standards on the project site.

2.3.9 Biological Resources Design Features

General Vegetation

- Avoidance of sensitive plants, including Tahoe draba.
- Installation of temporary water quality Best Management Practices (BMPs). These may include but will not be limited to: fiber rolls, silt fences, straw wattles, coir logs, mulching, gravel/sand bags and construction fencing.
- Limited disturbance and construction staging areas.
- Limit tree removal to minimum amount necessary, including whitebark pine where present.
- Over-the-snow tree removal and yarding, over a minimum 12” compacted snow.
- All tree removal is planned to be conducted over the snow in the spring following the close of operations.
- Trees will be skidded over a minimum of 12” of compacted snow behind a snow cat to designated staging areas in order to prevent soil disturbance. Trees will be limbed and chipped at the staging area for use for erosion control and soil amendments.
- No areas of mapped archaeological features will be used. Off-limits areas will be identified and established jointly by Heavenly and Forest Service staff near these sensitive areas and lined with rope barriers in order to prevent access.
- Proper backfilling and compaction of all excavations.
- Separating topsoil and duff layers from excavation spoils for later re-use in revegetation where possible.
- Implementing site-specific revegetation, soil erosion and sedimentation plans and specifications.
- Incorporating organic material into soil amendments to promote soil infiltration and plant establishment.
- Implementing permanent water quality BMPS following project construction.
- Re-establishing vegetation and soil function capacities at staging areas following project completion.
- Dust control measures, at construction sites and on roads.
- Use EPA Tier 2 / Tier 3 level engines and power units to minimize emissions.

- Specific pre-construction and post-construction monitoring evaluations of disturbed areas and success of revegetation.

- Multi-year, post-construction monitoring and reporting of construction areas as required by the Forest Service BMP Effectiveness Protocol Program.

Boechera (arabis) rigidissima var. demote (Galena Creek rockcress)

- If sensitive plants are discovered during implementation, a 100-foot buffer will be placed around the plants and facilities shall be sited outside of the buffer.

- Continue to implement employee training program for Boechera (Arabis) rigidissima var. demote and Tahoe draba for those employees associated with summer operations.

- Continue to implement long-term Tahoe draba monitoring and sensitive plant surveys including Boechera (Arabis) rigidissima var. demote.

- Implement all invasive plant management measures enumerated in the Invasive Plant Risk Assessment

Pinus albicaulis (Whitebark pine)

- To the extent feasible, healthy whitebark pine trees will be retained.

- During construction, avoid material damage to those trees not proposed for removal.

- Prior to project implementation, trees proposed for removal or limbing will be marked by USFS Vegetation staff (based on preliminary identification by Heavenly Mountain Resort) and inspected by the Forest Botanist or their designated appointee.

- Survey all stands where project activities would result in the removal of whitebark pine for 'Plus Trees' prior to tree removal activities. If 'Plus Trees' are found, Heavenly will notify the Authorized Officer who will coordinate cone collection activities with the Forest botanist and Silviculturist.

The following measures relevant to terrestrial wildlife species and habitat will be incorporated into the design and implementation of the project:

- WL -1: Prior to construction, all contractors, and subcontractor project personnel will receive training from qualified resource specialists regarding the appropriate work practices necessary to effectively implement the design features and to comply with the applicable environmental laws and regulations, including appropriate wildlife avoidance measures; impact minimization procedures; the importance of sensitive resources, and the purpose and methods for protecting such resources.
- WL-2: All survey results will be submitted in electronic from (i.e. data sheets and GIS) to USFS biologist prior to project implementation.
- WL-3: Conduct pre-implementation pedestrian visual surveys for marten dens in all Project areas no more than three weeks before project initiation (i.e., ground or tree disturbance) and regardless of season. Surveys will consist of visually inspecting the Project area and a 50 meter buffer for possible dens. Likely den sites will be further monitored by remote camera in order to determine if they are being actively used by marten. Based upon the results, the Responsible

Official may implement a Limited Operation Period (LOP) and/or adapt construction timelines or facility locations as determined necessary to provide adequate protection.

- WL-4: Nesting bird surveys will be conducted no more than 30 days prior to construction activities if work is scheduled to occur during the breeding season—April to August. If a nest is found, exclusionary avoidance zones (to be determined based on species-specific needs) will be created surrounding any active nests along the project alignment.
- WL-5: Designs for the project shall be incorporated (where applicable) that discourage birds from nesting on the proposed structures. Examples of such designs are placement of netting or bird deterrent spikes in areas to prevent the construction of nesting birds and to limit access to platforms or areas that are suitable for nesting.
- WL – 6: Spotted owl and northern goshawk surveys will be conducted as they normally are throughout the Heavenly permit boundary. If a nest is found the USFS will be contacted. The Responsible Official may designate a Protected Activity Center (PAC), implement an LOP, and/or adapt construction timelines or facility locations as determined necessary to provide adequate protection.
- WL -7: Bat surveys will be conducted in the spring, no more than 30 days prior to the start of construction, in order to identify active bat roosting sites, such as snags, complex trees, and/or large diameter trees. All potential roosting sites will be surveyed by a qualified biologist in order to determine usage. Specific survey methodologies will be determined in coordination with the appropriate land manager (i.e. USFS). If an active roost is identified, the Responsible Official may implement an LOP and/or adapt construction and/or tree removal timelines necessary to provide adequate protection to the individuals in the roost.
- WL-8: For the snowmaking pipeline extension/relocation work, an environmental monitor will inspect all excavations and areas of active construction on a daily basis for trapped wildlife. Wildlife found in active construction areas will be allowed to passively leave the site. If necessary, wildlife may be relocated by a qualified biologist. The construction foreman will notify the environmental monitor immediately if any wildlife enters or becomes trapped in the work area.
- WL- 9: If any sensitive species are found in the project area during implementation, the contractor on site, Heavenly, or the biological monitor will contact the USFS within 24 hours. Any implementation activities that could disturb or hurt the sensitive species will be paused while the USFS is being contacted.
- WL -10: All trash and food will be removed from the site at the end of each workday in order to deter wildlife from entering the site.
- WL -11: No harm, harassment, or collection of plant and wildlife species will be allowed. Feeding of wildlife will be prohibited.

2.4 Summary of Environmental Consequences

Chapter 3 of this EA discusses the environmental consequences of the No Action and Proposed Action alternatives by resource area, including direct, indirect, and cumulative effects. The following Table 6 provides a comparative summary of these effects. The EA does not provide a detailed evaluation of effects associated with air quality, noise, transportation, land use, or public service and utility resources as no negative direct, indirect, or cumulative effects are anticipated that have not already been addressed through the 2007 Master Plan Amendment EIR/EIS/EIS and 2015 Epic Discovery EIR/EIS/EIS.

Table 6. Upkeep and Management of Trails, Roads, & Facilities, Reissuance of Special Use Permits

Resource	No Action Alternative	Proposed Action
Recreation	Continued presence of obstacles (trees, boulders, downed large debris) on ski runs requiring additional snowmaking and limited width of the ski trails preventing consistent grooming and resulting in inconsistent opening of the affected trails. Failure to open Advanced Roundabout and Meteor would persist during periods of low snow due to the absence of snowmaking on these trails.	Widening ski trails and removing obstacles allows for improved skier experiences and maintenance of the trails by grooming equipment, and reduces user bottlenecks to enhance recreation. It will be necessary to relocate the existing snowmaking lines on widened trail sections to the new trail edge in order for them to remain effective. While some tree removal could detract from the natural atmosphere of the recreational experience, the removal of bottleneck locations will allow for overall enhanced conditions and recreational atmosphere.
Scenic Resources	No effect.	Project activity is consistent with Forest Plan scenic integrity objectives. Removal of surface obstacles during run hazard reduction would not be visible offsite and would be insignificant or undetectable when snow is present within the SUP area. Tree removal would widen some existing trails where user congestion occurs, however only Ridge Run and Upper Powderbowl widening would be visible from distant viewpoints offsite where the change in visual quality would be imperceptible. Tree removal would not adversely affect views within the SUP as trees would be removed along existing corridors, resulting in minor visual change.
Forest Vegetation	No effect.	Project activity will result in tree removal and the removal of trees larger than 30 inches dbh. The Forest Plan provides for the removal of large trees in certain circumstances associated with special use permits. The Project has been revised to include feathering of tree removal on the edges of the larger trail widening areas

		in order to retain trees larger than 30 inches dbh where possible to achieve the purpose and need.
Botanical Resources	No effect.	Project activity will result in disturbance to Tahoe draba and Austin's milkvetch. The Heavenly Master Plan includes measures to require the avoidance of Tahoe draba populations and other sensitive plants within the Lake Tahoe Basin. The Project has been revised to exclude the areas proposed for Ski Run Hazard reduction where known Tahoe draba populations and Austin's milkvetch plants exist.
Wildlife	No effect.	Project activity will not result in disturbance to sensitive wildlife species or their habitat. Master Plan mitigation measures will ensure protection of any unknown den sites or nests.
Fisheries & Aquatic Resources	No effect.	No effect. Project actions are not located within or adjacent to water bodies or drainages.
Soils & Hydrology	No effect.	Project actions are consistent with Forest Plan standards and guidelines. Analyses conclude that the Proposed Action proposal includes resource protection measures and design features that are appropriate and adequate to control erosion on- and off-site and stabilize soils during and upon completion of construction and other soil disturbance activities. Project-level effects would not result in direct or indirect adverse effects to surface runoff or soil erosion and water or soil quality.
Heritage	No effect.	No effect. Project actions would not occur in areas of known heritage resources.

Chapter 3 - Environmental Consequences

The following section discloses the environmental consequences for key resource areas for Alternative 1 – No Action, and Alternative 2 - Proposed Action. Minor revisions and clarifications generated from the receipt of public comments have been incorporated into this EA.

The EA does not provide a detailed evaluation of effects associated with air quality, noise, transportation, land use, or public service and utility resources as no negative direct, indirect, or cumulative effects are anticipated that have not already been addressed through the 2007 Master Plan Amendment EIR/EIS/EIS and 2015 Epic Discovery EIR/EIS/EIS. A brief discussion of these resource areas is included below. Adopted mitigation measures implemented at Heavenly Mountain Resort are provided in Appendix C. These mitigation measures are implemented as needed or required throughout the lifespan of the Master Development Plan.

Air quality impacts would consist of construction-related grading fugitive dust and construction equipment exhausts. Fugitive dust would be controlled through continued implementation of Measure 7.4-10: Reduce and Control Fugitive Dust, and Measure: 7.5-9 Reduce Vehicle Emissions. Under Mitigation Measure 7.4-10, Heavenly requires staff and contractors to use chemical dust suppressants and/or water on unpaved roads, graded and excavated areas and, material storage piles. Contractors are also required to clean on-site paved roads daily to remove tracked-on dirt and mud. Under Mitigation Measure 7.5-9, Heavenly requires that construction equipment operating procedures be followed, including equipment maintenance and equipment idling limitations. In addition, Mitigation Measure 7.5-9 requires construction equipment to use low-sulfur diesel fuel and low NOx emitting engines. Temporary increases in air emissions during construction are not expected to result in indirect impacts or cumulative effects with the continued implementation of these construction emission measures from Heavenly's 1996 MP, 2007 MPA, and 2015 Epic Discovery Project EIR/EIS/EIS documents.

Noise impacts would consist of construction-related equipment noise for tree removal, run hazard reduction activities, and onsite and offsite hauling. Noise generated by these activities would not exceed area threshold levels. Mitigation Measure 7.5-12: Rock Busting Noise Mitigation Methods would be implemented as needed during hazard removal activities. Audible noise from blasting is not commonly considered a significant source of annoyance if blasting is controlled to meet project safety standards. Operations on the trails following construction would not increase snow grooming, snow making, or snow removal activities that would result in increased noise generation above area noise limits or conflict with standards. Extension of snowmaking infrastructure to meet the new edge of widened trails would not result in new noise emissions associated with snowmaking, as snowmaking is already present in these locations. Hazard reduction would result in the need for less snowmaking and more efficient operation of trail grooming, so no increase in noise levels from those operations would occur. No indirect or cumulative noise effects would occur as no additional projects are planned concurrently in this area.

Effects on transportation would consist of construction-related traffic such as onsite and offsite hauling, construction equipment movement to and from the area, and worker trips. Any associated increase in traffic would be temporary and would not be of a substantial volume to create impacts not already addressed in the 2007 and 2015 EIR/EIS/EIS documents. No indirect transportation impacts are anticipated as traffic increases would be limited to the active construction period. Since this Project would not increase operational traffic, it would not contribute to an ongoing cumulative impact.

Likewise, Heavenly has not scheduled concurrent construction of other major components of the 2007 MPA or Epic Discovery Projects; therefore, construction traffic in the vicinity would not be cumulatively considerable. Much of the construction traffic would be confined to the site and would not create an adverse effect on the area.

No new demand for public services such as police or fire protection, schools, or government services would occur as the Project proposes to maintain or enhance existing recreational uses and does not propose new uses or changes that would increase visitor rates. Likewise the demand for utilities such as communications, energy, water, and sewer service would not increase. By removing run hazards, the Project reduces the need for snowmaking or the degree of snowmaking needed to create enough snow cover to open the affected trail. This reduces the demand for water and energy, creating a beneficial impact and improving system efficiency as detailed in Table 3. The projected savings of 10.9 million gallons of water and over 365,000 killowatts represents a 30% savings of water and energy resources used during snowmaking operations on the treated trails. Since no increase in demand for public services or utilities would occur, the Project would not contribute to a cumulative impact or result in a direct or indirect effect.

The Project proposes to conduct maintenance activities on the existing ski trails and would not create a new land use, increase long-term population or employment, or create a demand for housing. Trail widening and hazard removal would not result in a change to the land use or conflict with the direction of the Forest Plan under the General Conservation designation. The affected area is within the General Conservation Management Area; therefore, active management and developed or roaded landscapes are expected. No new trails would be constructed, but some existing trails would be enhanced through selective widening at existing user bottleneck locations, removal of existing trail hazards, and associated relocation of existing snowmaking lines. No new types of activities are proposed and no increase in visitor rates are expected.

The process for considering cumulative effects and the projects considered under the cumulative effects analysis are provided in Appendix D of this EA. Projects considered cumulatively include those listed in the 2007 Master Plan Amendment and the Epic Discovery Project. Chapter 3 of the Heavenly Mountain Resort Master Development Plan includes figures showing the location of the proposed facilities.

3.1 Recreation Resources

The scope of this recreational analysis is specific to areas within Heavenly's SUP boundary where projects are proposed, including the following trails: Olympic Downhill, $100 Saddle, Stagecoach, Bonanza, Comet, Little Dipper, Big Dipper, Orion, Meteor, 49er, Sam's Dream, California Trail, Ridge Run, Ridge Way, Cascade, Powderbowl, and Roundabout.

3.1.1 Background

There were approximately 160,973,000 National Forest visits nationwide in 2012, of which approximately 86 percent of visits were for the purpose of recreation. The importance of recreational resources on NFS lands is articulated throughout Forest Service regulation and planning documents. The Forest Service Framework for Sustainable Recreation defines visions and guiding principles to expand and enhance recreational opportunities on National Forests, while recognizing the positive effects of outdoor recreation on the health of users and their interest in natural resource protection (USDA, 2010). The Lake Tahoe Basin is composed of approximately 200,000 acres, of which approximately 150,000 acres are managed by the LTBMU. The LTBMU receives over 7.4 million visitors every year, and is one of the most visited forests in the Pacific Southwest Region of the Forest Service, which includes all of California. Visitation has steadily increased from approximately 3.4 million annual visits in 2005. Approximately 83 percent of visitors to LTBMU engage in recreation during their stay.

The development of trails, lifts, infrastructure, and skier facilities has occurred on NFS lands at Heavenly since the ski area's inception in 1955. Six decades later, Heavenly offers approximately 4,800 skiable acres of terrain on 94 trails, chutes, bowls, and glades across NFS lands within the 7,200-acre SUP area and adjacent private lands. This gives Heavenly the distinction of being the largest ski area in California. A typical winter ski season at Heavenly lasts from mid-November through mid-April, averaging 360 inches of snowfall.

Heavenly operates a variety of services across its terrain. Heavenly's terrain classification is roughly 20 percent Beginner, 45 percent Intermediate, and 35 percent Advanced/Expert. There are four base areas, of which two are in Nevada and two are in California, that provide access to Heavenly's lift and terrain network. Operations include 29 lifts: one detachable eight passenger gondola, one tram, two high-speed detachable "six pack" chairlifts, seven high speed detachable quad chairlifts, 6 fixed-grip triple chairlifts, three fixed-grip double chairlifts, six surface lifts, and three magic carpets. There are six on-mountain guest service facilities located across the SUP area. The network of mountain roads provides access throughout the resort for maintenance and operational functions.

Snowmaking occurs on over 310 acres of terrain of all skill levels, with most snowmaking on Novice and Intermediate level terrain. As discussed in the 2007 Master Development Plan, approximately 4.0 acre feet of water is consumed per acre of terrain with snowmaking. This high consumption rate is due to the existence of natural obstacles, primarily bounders or large logs, within the developed trail network. Although many of these obstacles were intentionally left on the trails during trail construction to avoid soil disturbance and associated erosion, the volume of debris requires a certain depth of snow, typically a minimum of five feet, to cover these obstacles. Without adequate coverage, the trails cannot be opened; therefore, a higher volume of snowmaking is required in the early season and during low-snow years.

3.1.2 Indicators for Analysis of Effects

Recreation standards and guidelines in the 2016 Forest Plan include the following:

SG104. Use ROS classification as a guideline for projects, activities, and permitted uses. [Guideline]

SG105. During implementation of projects with the potential to affect recreation activities, implement measures to minimize impacts to recreation opportunities, facilities, and visitor safety. Such measures could include limited use or temporary closures. [Guideline]

SG109. Within the alpine skiing prescription boundary, as shown on Figures 11-14, expansion of existing ski facilities shall be permitted based upon an approved master plan for the future facilities. [Standard]

SG112. Trails developed and used by special use permit holders shall be maintained to Forest Service standards by the permit holders. [Standard]

The Forest Plan recognizes Heavenly Mountain Resort as an Alpine Skiing Management Prescription Area and permitted ski area, where the emphasis of the use is on recreational skiing.

3.1.3 Analysis of Direct/Indirect Effects

3.1.3.1 No Action - Alternative 1

Selection of the No Action Alternative would not lead to any change in the current recreational offerings or experience throughout the Heavenly SUP area. Because Alternative 1 does not address identified opportunities and constraints, selection of this alternative would eventually lead to a diminished recreational experience at Heavenly due to the continued presence of trail bottlenecks, reduced run grooming, trail hazards, and snowmaking deficiencies. Heavenly would also continue to focus large amounts of energy (for snow grooming or snowmaking operations) and water resources (for snowmaking on trails with infrastructure) on opening Little Dipper, Meteor, Cascade, Sam's Dream, California Trail, Stagecoach, Advanced Roundabout, Ridge Run, Powderbowl and Olympic Downhill.

3.1.3.2 Proposed Action - Alternative 2

The Proposed Action would have a beneficial impact on the recreational experience within the Heavenly SUP area. Although it would not create new recreational uses, it would improve the existing winter recreation experience by removing bottleneck points on the affected trails and removing run hazards that create poor grooming conditions or prevent some trails from being opened without extensive snowmaking. Removing bottlenecks on 49er, Orion, Big Dipper, Cascade, Sam's Dream, Ridge Way, Ridge Run, Olympic Downhill, $100 Saddle, Powderbowl, Comet, and Bonanza would create more efficient use of these trails and enhance the user experience by reducing "heavy traffic areas". Implementation of run hazard reduction on Little Dipper, Meteor, Cascade, Sam's Dream, California Trail, Stagecoach, Advanced Roundabout, Ridge Run, Powderbowl and Olympic Downhill would be an operational and recreational benefit to Heavenly and their users. Reducing the height of natural obstacles results in less time needed to make snow and properly groom the trails, and less water and energy consumption to open the trails that include snowmaking infrastructure. This allows for a greater number of trails open during the early season/holiday period.

Construction activities such as blasting, tree removal, or extension or relocation of existing snowmaking infrastructure requires the use of heavy equipment. During construction, access to summer recreation in portions of the East Peak Basin and Adventure Peak areas may be temporarily limited. However, signage

and staff would be provided, as appropriate, to caution and redirect summer users during any area closures. Construction, including over snow tree felling, would occur outside the regular winter ski season.

3.1.4 Cumulative Effects

As discussed in the Introduction to this chapter of the EA, Appendix D identifies past, present, and reasonably foreseeable future projects within the Heavenly SUP area that have potential to affect the environment. A majority of past projects underwent site-specific environmental analysis compared to the baseline conditions prior to their approval. Future projects, including those projects programmatically analyzed in the 2007 Master Plan will necessitate site specific analysis before they can be approved or implemented.

Cumulative recreational impacts of full build-out of the 20017 Master Plan includes:

- 37 lifts (23 aerial and 14 surface lifts as compared to the existing 29 lifts
- 10 guest service facilities, as compared to the existing six facilities
- 813 acres of developed trails, compared to the existing 662 acres

Since the effect of widening trails to remove existing bottlenecks and removing hazards on runs that prevent their use unless adequate snow coverage is present would be beneficial for recreation, the Project would not contribute toward an adverse cumulative effect. Cumulatively, approval and implementation of the 2007 Master Plan, Epic Discovery Project, and these Proposed Actions under the 2017 Capital Improvement Project would improve the recreational opportunities within the SUP area.

3.1.5 Analytical Conclusions

The Proposed Action would result in a beneficial impact or improvement to the recreational experience within the Heavenly SUP area. Maintenance of or improvement to existing trails to correct inefficiencies in skier circulation, trail grooming, and water and energy use for snowmaking would benefit the skier experience and contribute to a long-term cumulative benefit toward recreational opportunities. No conflict with the recreation standards and guidelines in the 2016 Forest Plan would occur as the Project would maintain existing trails to enhance the recreation experience and improve operations under Heavenly's current Master Development Plan. Since the Proposed Action would improve the recreational experience, while Alternative 1 (No Action) would maintain the current recreational experience, The Proposed Action (Alternative 2) is superior as it increases facility and operational efficiency and improves trail accessibility during periods of low snow and high demand.

3.2 Scenic Resources

Analysis of the scenic environment requires an evaluation of the project area and its ability to absorb the effects of both historic and ongoing human modification. Slope, natural vegetation types and patterns, topography, and viewing distance are important factors in this analysis. Development of on-mountain/base area facilities and infrastructure, as well as developed trails, at Heavenly has occurred gradually since 1955. For this analysis, the potential impacts to the scenic environment were considered in relation to the overall existing development/recreational theme of the resort and adjacent private lands.

3.2.1 Background

Heavenly is located on the south shore of Lake Tahoe, and while it provides expansive views of the lake from the mountainside, it is also visible from the lake (foreground and middleground views) and other viewing areas around the lake (middleground and background views). Portions of Heavenly's Nevada trails can be seen from background views on Highway 395. The management emphasis within the Heavenly SUP area is on alpine skiing, and development and use of trails, lifts, and other skier infrastructure and facilities has occurred onsite since 1955, creating an area visibly recognizable as a ski resort.

The topography of the SUP area includes steep slopes, large open bowls, basins, glades, and chutes. As stated in the Heavenly Ski Resort Master Plan 1996 EIR/EIS/EIS and 2015 Epic Discovery Project EIR/EIS/EIS, the distinguishing natural visual characteristics of the site include steep mountains, which are evenly covered by conifer trees that intermittently reveal light gray rock outcroppings, light green grasses, and dark green shrubs and groundcover. The visual character of the area is primarily conifer forest with rock outcroppings, grasses, shrubs, and groundcover which results in even coverage, with variation in texture and color ranging from dark to light green vegetation to gray rocky areas with intermittent variation from existing ski runs, resulting in sharp contrast in color, texture and form due to clearing. Visual features associated with the operation of ski facilities, such as ski lifts (support towers and cables) and ski trails (tree clearings), are more visible from distances due to close-range view obstruction by intervening vegetation and topography.

This visual analysis will use information taken where appropriate from the Heavenly Mountain Resort Master Plan Amendment Final EIR/EIS/EIS certified in 2007. The Heavenly Mountain Resort Master Plan Amendment Final EIR/EIS/EIS assessed the scenic quality impacts of the Master Plan Amendment and the environmental setting contained in that document remain relevant. In addition, descriptions of environmental and regulatory setting contained in the Heavenly Ski Resort Master Plan 1995 Draft EIR/EIS/EIS, 1998 Heavenly Ski Resort Gondola Project EA and 2000 Revised Gondola Project Visual Analysis are incorporated by reference in this visual resource analysis. The Heavenly Ski Resort Master Plan 1995 Draft EIR/EIS/EIS described the affected environment (Chapter 4.10, pages 4.10-1 through 4.10-16) and the Impact Evaluation Criteria (Chapter 4.10, pages 4.10-17 through 4.10-50). Those sections of the Heavenly Ski Resort Master Plan 1995 Draft EIR/EIS/EIS are hereby referenced. Likewise, the 2015 Epic Discovery Project EIR/EIS/EIS Section 3.10 Visual Resources described and assessed the visual impacts of the summertime actions proposed under the Epic Discovery Project, many of which are in the vicinity of the affected trails of this Project.

Figures 3.10-2, -3, and -4 in Section 3.10 of the Epic Discovery Project EIR/EIS/EIS depict the visibility of three areas on the mountain. As documented in the figures, the majority of Heavenly's upper mountain ski facilities are not visible from most nearby viewpoints (e.g., less than 2 miles) in the South Lake Tahoe area. Photos in EIR/EIS/EIS Section 3.10 also show that the majority of the SUP area is not visible as the ridge of the ski area boundary creates a visual screen. Project areas that are visible from distant viewpoints on the western end of the south shore include the upper portions of Ridge Run and Upper Powderbowl. Figure 10 shows one of the viewpoints used for the Epic Discovery Project EIR/EIS/EIS and documents the locations of the Upper Powderbowl trail location.

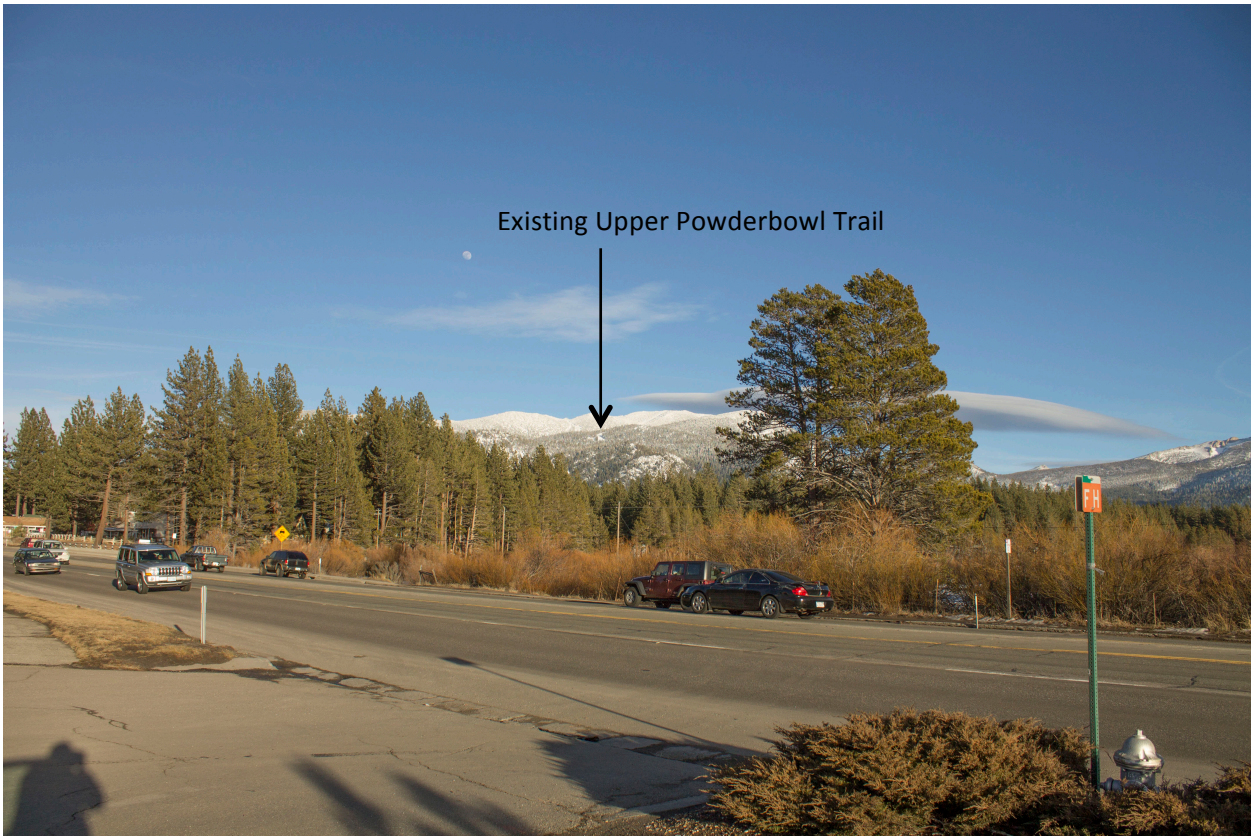


Figure 10. Epic Discovery Project EIS Photo Point 10 (US 50/Upper Truckee River Meadow) - Existing Conditions

3.2.2 Indicators for Analysis of Effects

The goal of scenic resource management on all NFS lands is to manage for the highest possible visual quality, commensurate with other appropriate public uses, costs, and benefits. Since the mid-1970s, the Forest Service has operated under the guidance of the Visual Management System (VMS) for inventorying, evaluating, and managing scenic resources on NFS lands. As stated in the 2016 Forest Plan, "Scenic integrity is a measure of the degree to which the valued scenic attributes are present within the landscape. The highest ratings given to landscapes with little no deviation from the character valued by constituents for its aesthetic appeal…." Developed ski areas were assigned a moderate rating, indicating visual improvement is needed, but that visual contrast from ski runs/trails is likely to remain.

The 2016 Forest Plan standards and guidelines for scenic resources includes the following:

SG117. Scenic resource and built environment guidelines are incorporated into management activities and into the design and development of agency facilities. All resource management and permitted activities shall meet or exceed the established scenery objectives shown on the Minimum Scenic Integrity Objective (MSIO) map. Utilize techniques such as:

a) Size areas cleared for management objectives to meet minimum requirements for operability and safety.
b) With consideration for scenic objectives, maintain clumps of trees within cleared areas if they do not pose a safety or operational risk.

c) Maintain understory vegetation within cleared corridors if they do not pose a safety or operational risk.

According to the 2016 Forest Plan Maps 10 and 11, the Minimum Scenic Integrity for the Heavenly SUP area is moderate, and the Minimum Scenic Stability ranges from Moderate to High. Since these are the minimally acceptable levels, project design should meet or exceed these objectives. The "moderate" assignment recognizes that the visual contrast created by cleared ski trails is likely to remain, but some visual improvement is needed or encouraged.

3.2.3 Analysis of Direct/Indirect Effects

3.2.3.1 No Action - Alternative 1

No changes to the existing condition would occur under the No Action Alternative; therefore, no visual change as a result of tree or boulder removal would occur and views to and from Heavenly would remain in the current condition. The No Action Alternative would have no visual effect.

3.2.3.2 Proposed Action - Alternative 2

Run hazard reduction activities would not be noticeable off-site as no perceptible change would occur from off-site viewing distances as a result of removing ground-level obstacles. Likewise, snowmaking infrastructure changes would not be perceptible.

Trail widening requires the removal of trees along the trail edges where the trees cause the runs to narrow or create a funnel. Widening would occur on 49er, Orion, Big Dipper, Comet, Bonanza, Cascade, Sam's Dream, Ridge Way, Ridge Run, Powderbowl, $100 Saddle, and Olympic Downhill. Plan sheets in Appendix B identify the portions of the affected trails where tree removal would occur.

The majority of trail widening would not be visible from off-site due to intervening topography and tree coverage. As shown in the figures in Section 3.10 of the Epic Discovery EIR/EIS/EIS, most of the facilities within the ski area boundary (excluding the gondola alignment and trails above the California Lodge, which are outside the project area) are obscured by intervening topography. Nearby views from U.S. 50 and from the waters of Lake Tahoe toward Heavenly Mountain Resort do not extend above the nearest ridgeline. The higher portions of the mountain, including Ridge Run and Upper Powderbowl trail, are visible from U.S. 50 near its intersection with State Route 89 approximately 4 miles from the ski area boundary. However, the viewpoints in this area become too distant to identify a substantial visual change from trail widening as demonstrated in Figure 10. The same is true of views from areas closer to the center of Lake Tahoe or further north (e.g., 5 to 10 miles away). Views of the trails near Sky Express and Canyon Express, such as Ridge Run are visible from the west shore and Lake Tahoe, but because of the view's distance, 2.9 acres of change from linear tree removal along an existing clearing would not be visually prominent or notable. Moderate tree removal along Ridge Run would not be of a magnitude to alter the visual character or the minimum scenic integrity or stability.

Tree removal and run hazard reduction will alter views from within the Heavenly SUP by modifying existing vegetation patterns, texture and form; however the visual change would remain subordinate to the surrounding landscape and visibility of the tree and hazard removal would be limited to the area in which viewers are located and further obscured by topography, retained trees, and other vegetation. Enlargement of the forest opening would not result in a substantial change to the visual character since the tree removal would occur along the edge of existing ski trails where trees were previously removed.

In addition, groundcover and low growing shrubs would be retained within the areas to be widened. Retention of existing groundcover and shrubs ensures the widened areas would not be visually prevalent from distances in the summer.

3.2.4 Cumulative Effects

Non-Heavenly projects on Forest Service lands in the area are not anticipated to change visual conditions in the vicinity of Heavenly or contribute to further visual effects from viewpoints around Lake Tahoe.

The remaining 2007 Master Plan projects that may be pursued within the Basin include the Powderbowl Lodge, which previous environmental documentation found would not be visible from offsite viewpoints. Remaining projects under the Epic Discovery project, such as the lookout tower in Sky Meadows near the proposed whitebark pine management area, have already been addressed in the Epic Discovery Project EIR/EIS/EIS and were found to have no adverse effect. Although the location of Epic Discovery projects are often near the trails to be widened under the Proposed Action, installation of summer ziplines and ropes courses does not require significant change to the canopy and the proposed hiking or excursion trails follow existing roads or clearings. The cumulative effect would not be greater than what was concluded in the EIR/EIS/EIS document.

Outside the Lake Tahoe Basin in Nevada, unbuilt ski runs and lift replacements were approved in the most recent Master Development Plan by the Forest Service. The Project does not include new components in these areas that would further decrease the scenic quality previously analyzed in the 2007 Master Plan EIR/EIS/EIS.

Other projects outside of the Lake Tahoe Basin would include the Stagecoach Development project approved by Douglas County for construction on Heavenly owned lands located outside of the National Forest boundary. This project would change the visual conditions at the existing Stagecoach base area with the replacement and expansion of the existing lodge and the construction of a 120- unit condominium and parking structure project on a portion of the existing base area parking lot. This project would not be visible from offsite viewpoint locations used for the analysis of this Project and would be consistent with other adjacent residential and commercial development located in the Stagecoach base area. In addition the development would be required to conform with Douglas County's design standards and guidelines.

3.2.5 Analytical Conclusions

Run hazard reduction and snowmaking infrastructure improvements would not result in noticeable change to the visual character of the mountain. Tree removal to widen portions of existing ski trails would result in an incremental change, with the greatest difference occurring in the immediate area surrounding the location of the tree removal. Tree removal would be limited to those portions of the trails where existing congestion occurs to allow for better skier and rider access along the trails. Since tree removal would occur adjacent to or within existing clearings, the increase in visual contrast created by linear clearings is minimized. The overall internal visual character of the resort would change only subtly and would be reflective of the existing ski trail linear clearings. While this change would contribute to visual modification, it would be consistent with the existing scenic character and Forest Plan direction and would result in a negligible change in the integrity of the scenic resource.

Because Alternative 1 would not result in any change from existing conditions, it is environmentally superior to Alternative 2 (Proposed Action) in the short-term; however it does not accomplish the

objectives of the project and the recreational impact of congested ski areas would not be resolved. Over time, skier gridlock would continue, adversely affecting the users experience. Likewise, the perpetuation of run hazards would prevent some trails from opening, reducing the area available to visitors to appreciate the scenic vistas from the SUP. The minor visual change resulting from the Proposed Action would not create an adverse effect. In the long-term, the Proposed Action is superior as it will maintain and expand, rather than decrease access to scenic vistas from within the SUP.

3.3 Forest Vegetation

The proposed Project is contained within the boundaries of the existing Special Use Permit Area in accordance with the 2003 Forest Service's Lake Tahoe Basin Management Unit (Forest Service) special use permit approval. Impacts to vegetation resources are confined within the boundaries of this area. Much of the following information has been taken from the 1996 MP EIR/EIS/EIS, the 2007 MPA FEIR/EIS/EIS (Section 3.8) and the 2015 Epic Discovery Project EIR/EIS/EIS (Section 3.8).

3.3.1 Background

Forest vegetation can be described by its arrangement or structure, such as diameter, height, percent canopy cover, and density, and composition of tree species, including the proportional representation of each species. The arrangement and composition of forest vegetation often is a result of the frequency and intensity of fires in an area and the area's ability to grow vegetation. Fires in an area, such as the Gondola Fire near the project area, affect the number and distribution of trees within the SUP as well as the type of trees found in the SUP. In areas absent of fire events, shade-tolerant species, such as white fir, can become a dominant component of the overstory, creating a denser distribution of trees. Over time, fire suppression activities have resulted in the increase in shade tolerant conifer species within whitebark pine stands (USFWS 2011). This change in structure and composition facilitates the increased severity and frequency of wildfire that could result in a stand replacing event and result in the loss of genetic diversity necessary for the species survival in the region. In areas of fire events, the tree density can be expected to be less dense, with varying levels of canopy cover, tree sizes and species. While fires create a changing factor that affects forest vegetation, an area's ability to grow vegetation remains static, with the exception of landslide or erosion events. Factors such as topography and aspect remain relatively the same over time.

The southern portion of the Lake Tahoe Basin supports three dominant and widely distributed forest associations, each of which occur within the Heavenly Master Development Plan Area. These associations are the Mixed Conifer-Fir, Lodgepole Pine, and Red Fir associations. The Mixed Conifer-Fir association is the high elevation counterpart of the Mixed Conifer-Pine association and typically occurs at elevations of 5,000 to 7,000 feet. The major species within this association include white fir (*Abies concolor*), red fir (*Abies magnifica*), and Jeffrey pine (*Pinus jeffreyi*). The lower elevations are primarily dominated by white fir and Jeffrey pine, while higher elevations are dominated by red fir. The dominant under story shrubs are greenleaf manzanita (*Arctostaphylos patula*), huckleberry oak (*Quercus vaccinifolia*), and snow bush (*Ceanothus cordulatus*).

The Red Fir association generally occurs at elevations of 7,000 to 9,000 feet and occurs in dense, pure stands or as an associate of the Mixed Conifer-Fir association. Typical under story species range from pipsissewa (*Chimaphila menziesii*) and wintergreen (*Pyrola picta*) in dense red fir stands with heavy litter accumulation to tobacco brush (*Ceanothus velutinus*), snow bush, pinemat manzanita (*Arctostaphylos*

nevadensis), and greenleaf manzanita in more open stands where the association intergrades with the Mixed Conifer-Fir association.

The Lodgepole Pine association typically occurs at elevations of 5,500 to 9,000 feet. This association is found either in dense, pure stands in swales with abundant year-round moisture or as scattered individual trees on very dry soil. Lodgepole pine (*Pinus contorta* ssp. *murrayana*) is an opportunistic species that often invades sites less suitable to the establishment and growth requirements of red fir or Jeffrey pine. However, in areas where micro site conditions change, red fir and Jeffrey pine may become established and replace the former species. The Lodgepole Pine association is therefore often found associated with both the Mixed Conifer-Fir and Red Fir associations.

Three additional forest associations of more limited distribution within the Lake Tahoe Basin are found within the Special Use Permit Boundary. These include the Jeffrey Pine, Whitebark Pine, and Mountain Hemlock associations. The Jeffrey Pine association occurs at elevations between 5,000 and 6,500 feet on frigid soil located east of the Sierra Nevada crest. Jeffrey pine also intermingles with western juniper (*Juniperus occidentalis*) on dry slopes and flats. Under story species in the Jeffrey Pine association include basin sagebrush (*Artemisia tridentata*), mule ears (*Wyethia mollis*), tobacco brush, bitterbrush (*Purshia tridentata*), and greenleaf manzanita.

The Whitebark Pine association occurs at or near tree line at elevations of 9,000 feet and above. Whitebark pine (*Pinus albicaulis*) grows in association with red fir, western white pine (*Pinus monticola*), and lodgepole pine on ridgetops or in pure stands on high elevation cryic (frozen) soil.

The Mountain Hemlock association is generally found on north or east facing slopes where snow accumulation holds well into the summer months. Mountain hemlock (*Tsuga mertensiana*) occurs as the dominant species in cold swales from 7,000 feet to 9,000 feet within the Red Fir association and in almost pure stands on ridgetops above 8,500 feet with western white pine. In moist areas, willows (*Salix* spp.) and mountain alder (*Alnus tenuifolia*) are associated under story species.

3.3.2 Indicators for Analysis of Effects

The goal of forest vegetation management in the 2016 Forest Plan is to improve, restore, and maintain forest health, to achieve a more resilient balance of forest stand densities, structure, and species composition. To achieve the desired conditions, the Forest Plan proposes objectives that would be accomplished primarily through: thinning to move overabundance of closed mid-seral to open mid-seral or accelerate movement from one seral stage to the next; and creating openings that emphasize group selections with reserves that move open or closed canopy mid-seral to early-seral. The 2016 Forest Plan standards and guidelines for forest vegetation, fuels, and fire management includes the following:

SG21. Apply an EPA registered borax compound to cut stumps in recreation and other high value sites according to Regional policy and recommended guidelines to limit the likelihood of heterobasidion root disease; outside of these areas determine the need to apply borax, based on biological considerations and management and restoration objectives. [Guideline]

SG22. Where possible, provide a 100 foot radius of defensible space around all structures on all USFS structures or USFS permitted structures as well as for non-federal structures adjacent to National Forest System lands. More than 100 feet of defensible space may be needed, depending on site conditions. [Guideline]

SG23. In conifer forest types, design fuel reduction treatments in conifer forest types so that post treatment flame lengths are less than 4 feet under 90 percentile fire weather conditions. [Guideline]

SG24. When designing forest health or fuels reduction treatments within a high use area or developed site, consider additional treatment measures as needed to address recreation needs. [Guideline]

SG25. When fuels are piled adjacent to trails or in high use areas or sites, ensure that project design includes proximity, pile size, and timing of burn to protect recreation and scenic resources. [Guideline]

SG26. Allow natural ignitions on NFS lands in all fire management units (FMUs), except the WUI defense zone, to meet forest plan desired conditions and objectives, when safety issues have been resolved and smoke impacts can be minimized. [Guideline]

SG27. Suppress all unplanned ignitions in the WUI defense zone. [Standard]

SG28. After wildfires and other large-scale natural disturbances, take prompt measures to reduce adverse effects on public safety, water quality, scenic quality, recreation use, wildlife, and forest health. During the planning of postfire restoration projects, reduce forest fuels as needed to meet fuel loading and fire behavior guidelines to provide for public safety. Prioritize objectives and consider ecological restoration utilizing Standards 60 and 61 below. The cost of restoration may be offset by the sale of timber and biomass. [Guideline]

SG29. Apply minimum impact suppression tactics (MIST) during fire management actions in wilderness and backcountry management areas. [Guideline]

SG30. In general, operate ground-based mechanized equipment for vegetation treatment on slopes less than or equal to 30%. Exceptions should be consistent with safety and design specifications and with the ability to effectively alleviate significant resource impacts. [Guideline]

SG31. When creating openings to restore forest structure/forest health use the group selection with reserve prescription within the mid seral stage. Openings shall range in size from less than 1 acre to 10 acres. Openings shall vary in size and shape and retain trees (singly and in clumps) to produce spatial and structural heterogeneity typical of early seral habitats. On a landscape basis, the majority of openings would be less than 5 acres. Shape and blend the edges of openings to the extent practicable with the natural terrain. [Guideline]

SG32. Select locations of openings (early seral creation or type conversion) on a project-specific basis and as part of the IDT process. Factors influencing the location of openings include but are not limited to the following: [Guideline]

a) proximity to PACs and HRCAs and detections of late-and mid-seral associated species
b) existing connectivity of habitat for species within or adjacent to project area
c) proximity to developed recreation sites, scenic resources, and cultural resources
d) proximity to open water and SEZs
e) proximity to communities
f) surrounding seral stages
g) spread of invasive species (e.g., animals, plants, pathogens)

SG33. Retain trees 30 inches dbh or larger except as described in S&Gs 34 and 35. Where trees greater than 30 inches DBH need to be removed, ID Team members (e.g., vegetation management specialist, wildlife biologist, scenic specialist, recreation management specialist) will propose trees to be removed, girdled for snag creation, or felled for coarse woody debris during project development. [Standard]

SG34. Exceptions under which a tree 30 inches dbh or larger can be removed include the following (a-d). These exceptions do not apply to PACs. In TECPS-occupied or known nesting, denning, roosting trees and adjacent high-habitat-value trees (e.g., trees that provide thermal or protective cover) removal, snag creation or felling for coarse woody debris of a tree equal to or larger than30 inches dbh is prohibited. [Standard]

> **a)** The tree(s) larger than 30 inches dbh presents a safety hazard, prevents equipment operability, or removal is required in conjunction with a special use permit (e.g., utility line).
> **b)** The tree(s) larger than 30 inches dbh has been successfully infected by disease and/or infested by insects with potential to spread to adjacent trees and is in a developed recreation site or facility site (e.g., a communication site).
> **c)** When necessary to support aspen, meadow or stream restoration
> **d)** When managing for blister rust resistant sugar pines that require removal of competing trees within a sufficient radius to improve health of the sugar pine. [Standard]

SG35. Allow removal of large trees (>30 inches dbh) to achieve desired conditions for the forest type (DCs 27-35) when

> **a)** the average dbh of overstory trees (dominant and co-dominant trees) within the stand is greater than 30 inches dbh and the stand density index (SDI) indicates that widespread mortality is imminent (e.g., SDImax), and
> **b)** reducing SDI to a prescribed level for the forest type that will maintain the stand below SDImax for 15-20 years requires removal of some large trees, and
> **c)** the selection for removal or snag or down log creation would allow competitive release for growth of the largest trees.
> **d)** Selection of trees for removal would give preference to shade tolerant trees, and where they exist, retain clumps of large trees. [Standard]

SG36. When designing forest health treatments (thinning) that would reduce canopy cover and/or basal area, minimum canopy cover and basal area retention requirements would be identified to maintain habitat quality for TEPCS species on a project-by-project basis. [Guideline]

SG37. Use the following resource prioritization gradient for vegetation treatments: fire and fuels objectives generally increase in priority with increasing proximity to communities while wildlife objectives generally increase in priority with increasing distance from communities and proximity to specific wildlife resources (e.g., nest and/or roost sites). [Guideline]

SG38. In late seral stands occupied by late seral associated TEPCS species, limit canopy cover and basal area reduction to levels that maintain or improve habitat conditions sufficient to support late seral dependent wildlife species [Guideline]

SG39. In late seral closed canopy stands (greater than 50 percent canopy closure), treatments shall not reduce canopy cover in dominant and co-dominant trees by more than 10% across a stand, and not below canopy cover retention required in standards and guidelines for TEPCS species. [Standard]

SG40. Retain current late seral-closed canopy (greater than 50 percent canopy closure) stands and when considering thinning of these stands, retain this seral stage as closed canopy outside of the WUI. Within the WUI, retain this seral stage as closed canopy if fire behavior objectives can be met. [Standard]

SG41. Consider retaining forested linkages (with canopy cover greater than 40%) that are interconnected via riparian areas and ridgetop saddles. [Guideline]

SG42. Leave burn piles of slash from vegetation treatments no closer than 25 feet from water bodies and intermittent or perennial stream channels. [Standard]

3.3.3 Analysis of Direct/Indirect Effects

3.3.3.1 No Action - Alternative 1

No direct or indirect impact to forest vegetation would occur under Alternative 1. Heavenly Mountain Resort would continue to operate under current conditions, including the ongoing implementation of mitigation measures as established in the 2007 MPA EIR/EIS/EIS and 2015 Epic Discovery Project EIR/EIS/EIS and Master Development Plan Mitigation Monitoring Plan.

3.3.3.2 Proposed Action - Alternative 2

The Proposed Action will result in the removal of trees in the locations proposed for trail widening. In order to estimate the number of trees proposed for removal, each tree stem was counted in September 2017 for two of the larger locations proposed for trail widening. Table 7 provides the number of trees proposed for removal by size for the OW-1 (Comet upper) and OW-2 (Orion upper) trail widening polygons. In order to estimate the number of trees 24 inches and larger that are proposed for removal in the rest of the trail widening locations, and for continuity with analysis included in 2007 Master Plan Amendment EIS and 2015 Epic Discovery EIS, stand data collected for the 2007 Master Plan Amendment EIR/EIS/EIS was utilized. The stands were surveyed in 2006 for project areas where future projects would be located. Based on the result of the 2017 counts completed for the OW-1 and OW-2 trail widening polygons, these 2006 stand characteristics remain valid today to estimate removal of trees larger than 24 inch dbh. Using these two datasets, the estimated number of trees required for removal (Table 7) and the number of trees likely to be 24 inch dbh and larger (Table 8) are presented.

Table. 7. Ski Trail Widening Tree Removal Estimate (using 2017 count data)

	Size Class (“ dbh)					
	0-6"	7"-12"	13"-24"	25"-29"	30"-+	Total
OW-1 (Upper Comet)	60	44	47	17	39	207
OW-2 (Upper Orion)	288	218	130	10	4	650

Table 8. 24" dbh and Greater Tree Removal Estimate (using 2006 data set projections)

	Trail Name	Acres	Stand	trees larger than 24" dbh/acre	24" trees est removed
In-Basin					
IW-1	49er	0.3	Von Schmidt	9.8	2.94
IW-2	Sam's Dream upper	0.3	Von Schmidt	9.8	2.94
IW-2	Sam's Dream island	0.1	Von Schmidt	9.8	0.98
IW-2	Sam's Dream mid	0.5	Von Schmidt	9.8	4.9
IW-2	Sam's Dream low	0.3	Von Schmidt	9.8	2.94
IW-3	Cascade	0.3	Von Schmidt	9.8	2.94
IW-4	Ridge upper	1.6	Upper CA	13.6	21.76
IW-4	Ridge lower	1.3	Upper CA	13.6	17.68
IW-5	Powderbowl	1	Lower CA	8.2	8.2
IW-6	Ridge Way	0.3	Upper CA	13.6	4.08
IW-7	Lower $100 Saddle	0.5	Upper NV	9.1	4.55
total in basin		**6.5**			**73.91**
Out-of-Basin					
OW-1	Comet upper	3.1	Upper NV	9.1	28.21
OW-1	Comet low	0.2	Upper NV	9.1	1.82
OW-2	Orion upper	6.4	Upper NV	9.1	58.24
OW-2	Orion mid	1.1	Upper NV	9.1	10.01
OW-2	Orion low	3.4	Upper NV	9.1	30.94
OW-3	Big Dipper	1.2	Upper NV	9.1	10.92
OW-4	Olympic "s" curves	3.2	Lower NV	14.8	47.36
OW-5	Bonanza	0.2	Upper NV	9.1	1.82
total out-of-basin		**18.8**			**189.32**
total in and out basin					**263.23**

Tree removal is required for the Proposed Action in order to complete trail widening projects and alleviate existing areas of user congestion. Utilizing the 2006 dataset that was noted above, approximately 263 trees that are larger than 24 inch dbh would be removed from the 25.3 acre trail widening area. Of these, an unknown percentage of them would be 30 inches and larger. The LTBMU Forest Plan requires the retention of 30 inch trees as outlined in SG33 above. Exceptions are allowed for the removal of certain 30 inch dbh trees. The location of the proposed ski trail widening projects and 30 inch dbh tree removal is not in any known nesting, denning, or roosting sites and is not within high-habitat value for special status species as noted in Section 3.5 below or within mapped late seral old growth areas. SG34 allows for the removal of trees larger than 30 inches dbh if the removal is required in conjunction with the issuance of a special use permit. Heavenly Mountain operates under a special use permit and the proposed trail widening is necessary to complete the project and to meet the Purpose and Need as discussed in Section 1.5.

In summary, the removal of 25.3 acres of forested area includes trees 30 inches dbh and larger, however not all the locations include trees in this larger size classification. The forested area included in the proposed removal is not considered Late Seral/Old Growth as it does not contain other important characteristics (CWHR Types 5D and 6 - >60% tree cover with average diameters >24 inches or with some trees >24 inches dbh and a multi layered canopy). Feathering of the edges of the proposed trail widening areas will allow for the retention of trees greater than 30 inches dbh where possible, thereby meeting the purpose and need while complying with the Forest Plan standards and guidelines.

3.3.4 Cumulative Effects

The following analysis evaluates cumulative effects from past, present, and future projects associated with the Heavenly Mountain Resort Master Development Plan. Past management and construction activities at Heavenly Mountain Resort has modified the vegetated environment since the resorts inception in the 1950s. Large areas of ski trails have been cut into the forested area as well as large areas that were graded to create these trails. These activities modified and fragmented the forested habitat. Quantitative estimations are more accurate for known occurrences than suitable habitat because the best available data for suitable habitat are only rough estimates; for effects to suitable habitat it is assumed that habitats that intersect proposed activities may be adversely affected, reducing the potential for a species to expand. The additional removal of 25.3 acres of forested area within the special use permit area, when compared with past forest removal results in a relatively small additional impact. The existing habitat within the ski resort operational footprint is a natural matrix of patches and is heavily influenced and impacted by fragmentation as a result of existing ski trails, roadways, facilities and past corridors cut through the forested environment for old ski lifts or utility; and is therefore compromised. Past analysis has shown fragmentation impacts exist mountain-wide and influence the majority of the area within the operational footprint. The removal of the proposed 25.3 acres of forested area would not result in the division of existing stands, but would widen the proposed trails in their respective locations and would expand fragmentation impacts to a lesser degree.

While it is likely that future effects may occur from future Heavenly operations and implementation of future Heavenly projects, these effects would be avoided due to compliance with existing standards and regulations, avoidance measures to be implemented with the development of each project, or habitat mitigation plans developed as part of future environmental documentation. As required by the 2016 Forest Plan, projects on National Forest system lands must insure that activities do not result in a loss of species viability.

3.3.5 Analytical Conclusions

Alternative 1 (No Action) is superior due to the fact that no trees will be removed and therefore no changes (direct loss of habitat) to the forested habitat will occur. However, Alternative 1 would not achieve the project objectives. The Proposed Action will have a limited impact on forest vegetation and will not conflict with the standards and guidelines as outlined in the Forest Plan. Project disturbance would occur in areas that are currently disturbed or directly adjacent to cleared and utilized trail areas, making the value of the habitat less desirable due to existing human presence and vegetation fragmentation.

3.4 Botanical Resources

3.4.1 Background

The affected environment for vegetation is detailed in Section 4.8 of the Heavenly Ski Resort Master Plan EIR/EIS/EIS, the Biological Evaluation for the Master Plan (EIR/EIS/EIS Appendix N), and in Section 3.8 of the Epic Discovery Project EIR/EIS/EIS. In addition, a project-specific Biological Evaluation was prepared for the Project and was submitted to the Forest Service for review and approval.

The BE evaluated impacts to the following sensitive plant species that are federally Threatened, Proposed, and Candidate, and Forest Service Region 5 Sensitive botanical species that are known or have suitable habitat on the LTBMU (see Table 9).

Table 9. Sensitive Plant Species Evaluated for Heavenly 2017 Capital Improvement Project

Species	Status*	Habitat Characteristics	Known to occur in botany analysis area	Potential habitat in botany analysis area
Arabis rigidissima var. *demota*	S, 1B	Open, rocky areas along forest edges of conifer and/or aspen stands; usually found on north aspects; 7,500 ft. & above.	Y	Y
Astragalus austiniae	1B	Exposed areas near ridgelines in El Dorado, Placer and Nevada Counties in the Sierra Nevada	Y	Y
Boechera tiehmii	S, 1B	Open rocky soils in the Mt. Rose Wilderness; 10,000 ft. & above.	N	N
Boechera tularensis	S, 1B	Shaded, mostly east-facing subalpine rocky areas, including rocky slopes, rock-lined streams and seeps, rocky outcrops, saddles, and canyons; 6,000- 11,000 ft.	N	N
Botrychium spp.		*Botrychium* species are found in similar habitat; wet or moist soils such as marshes, meadows, and along the edges of lakes and streams; generally occur with mosses, sedges, rushes, and other riparian vegetation; 2,000-10,000 ft.		
Botrychium ascendens	S, 2	See *Botrychium* spp.	N	Y
Botrychium crenulatum	S, 2	See *Botrychium* spp.	N	Y
Botrychium lineare	C, S, 1B	See *Botrychium* spp.	N	Y
Botrychium lunaria	S, 2	See *Botrychium* spp.	N	Y
Botrychium minganense	S, 2	See *Botrychium* spp.	N	Y
Botrychium montanum	S, 2	See *Botrychium* spp.	N	Y
Bruchia bolanderi	S, 2	Mainly in montane meadows and stream banks, but also on bare, slightly eroding soil where competition is minimal.	N	N
Dendrocollybia racemosa	S	On old decayed or blackened mushrooms or occasionally in coniferous duff, usually within old growth stands.	N	Y
Draba asterophora var. *asterophora*	S, SI, 1B	Rock crevices and open granite talus slopes on north-east slopes; 8,000- 10,200 ft.	Y	Y
Draba asterophora var. *macrocarpa*	S, SI, 1B	Steep, gravelly or rocky slopes; 8,400- 9,300 ft.	N	Y
Draba cruciata		Subalpine gravelly or rocky slopes, ridges, crevices, cliff ledges, sink holes, boulder and small drainage edges; 7,800-13,000 ft.	N	Y

Table 9. Sensitive Plant Species Evaluated for Heavenly 2017 Capital Improvement Project				
Species	**Status***	**Habitat Characteristics**	**Known to occur in botany analysis area**	**Potential habitat in botany analysis area**
Erigeron miser	S, 1B	Granitic rock outcrops; 6,000 ft. & above	N	Y
Eriogonum luteolum var saltuarium	S	Sandy granitic flats and slopes, sagebrush communities, montane conifer woodlands; 5,600-7,400 ft.	N	N
Eriogonum umbellatum var. *torreyanum*	S, 1B	Dry gravelly or stony sites; often on harsh exposures (e.g. ridge tops, steep slopes)	N	Y
Helodium blandowii	S	Bogs, fens, wet meadows, and along streams under willows.	N	Y
Hulsea brevifolia	S, 1B	Red fir forest, but also in mixed conifer forests; found on gravelly soils; 4,900- 8,900 ft.	N	Y
Ivesia sericoleuca	S	Associated with seasonally wet meadows, meadow ecotones, terraces and toeslopes on soils which are primarily volcanic in origin. The plant has not been located on granitic soils.	N	N
Lewisia kelloggii spp. hutchisonii		Ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil; 5,000-7,000 ft.	N	Y
Lewisia kelloggii ssp. kelloggii		Ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil; 5,000-7,000 ft.	N	Y
Lewisia longipetala	S, SI, 1B	North-facing slopes and ridge tops where snow banks persist throughout the summer; often found near snow bank margins in wet soils; 8,000-12,500 ft.	N	N
Meesia triquetra	S, 2	Bogs and fens, but also very wet meadows.	N	N
Meesia uliginosa	S, 2	Bogs and fens, but also very wet meadows.	N	N
Orthotrichum praemorsum	S	Shaded, moist habitats of east side of Sierra Nevada rock outcrops; up to 8,200 ft.	N	N
Peltigera gowardii	S	Cold unpolluted streams in mixed conifer forests.	N	Y
Pinus albicaulis	S, C	Subalpine and at timberline on rocky, well-drained granitic or volcanic soils.	Y	Y
Rorippa subumbellata	C, S, SI, SE, 1B	Subalpine and at timberline on rocky, well-drained granitic or volcanic soils.	N	N

Source: USDA Forest Service, List of Sensitive Species of the LTBMU 2013; Tahoe Regional Planning Agency, Environmental Thresholds. CNDDB, August 2017

* Status Codes:

List revised 2013

No species in LTBMU are currently listed as "Threatened or Endangered" by the U.S. Fish and Wildlife Service under ESA.

CNPS 1B, 2, 3 = Plants listed as rare, threatened or endangered in California and elsewhere by the California Native Plant Society. All of the plants on this list meet the definitions of Section 1901, Chapter 10 (Native Plant Protection) of the California Department of Fish and Game Code and are eligible for state listing.

C = USFWS Candidate species for listing as threatened or endangered under ESA

S = U.S. Forest Service LTBMU Sensitive Species, Regional Forester's Sensitive Species List, Amended 2013

SI = TRPA Special Interest Species, Regional Plan for The LTBMU: Goals and Policies (1986) and Code of Ordinances (1987)
SE = State Endangered in California and/or Nevada

Of these species, Tahoe draba (*Draba asterophera var. asterophera*), Galena Creek rockcress (*Bochera rigidissima =Arabis rigidissima var. demota*), Austin's milkvetch (*Astragalus austiniae*) and whitebark pine (*pinus albicaulis*) have potential to occur or are known to occur in the project area.

Tahoe draba occurs in rock crevices and open granite or volcanic, north or east facing talus slopes at high elevations between 8,000 and 11,499 feet. This species is found in areas of sparse cover and is often associated with other pin-cushion plants. In the project area, there are six occurrences of Tahoe draba. There is one occurrence in the analysis area consisting of fourteen sub-occurrences occupying approximately 25 acres; most current survey data indicate that these occurrences total over 5,000 plants, but quantities are estimated for two occurrences.

Galena Creek rockcress is a perennial forb that occurs in sandy to rocky soils derived from granitic or volcanic materials, primarily on moderate to steep northerly aspects, often in drainage ways, in moisture accumulating microsites, near meadows edges, or in dry openings in conifer forests from 7,200 to 10,020 feet (NNHP 2012). Galena Creek rockcress is known to occur in only one location (ARRID6b) within the Heavenly Mountain Resort Special Use Permit Boundary and plants at this occurrence have not been found in the last eight years. Recent surveys indicate that there is suitable habitat within the project area, but no quantitative estimate was provided (Hauge Brueck Associates 2012, 2013).

Whitebark pine is a 5-needle white pine with broad distribution at high elevation and timberline zones in the western United States and Canada. This species occurs on slopes and ridges near timberline, often with cold windswept exposures, resulting in geographically isolated stands (Arno and Hoff 1989). Within Heavenly Mountain Resort, whitebark pine exists at higher elevations in mixed stands above 8,000 feet and as pure stands along ridge tops and slopes above 9,200 feet to the top of Monument Peak at 10,100 feet. The distribution of whitebark pine within the Special Use Permit Boundary were re-classified using local knowledge and aerial photography to determine the location of whitebark dominant stands. It should be noted this is a different methodology than was used to estimate the extent of whitebark pine on the LTBMU and therefore estimates may not correlate. Based on the re-classification/mapping exercise, a total of 910 acres of whitebark dominant stands were identified and 2,827 acres of mixed stands with the potential for whitebark pine to be present. A Whitebark Pine Partnership Action Plan has been drafted to manage the whitebark pine stands located within the Heavenly Special Use Permit Boundary. This plan has been accepted and approved by LTBMU and Heavenly as a guide going forward to protect and manage whitebark pine within the Heavenly Mountain Resort Special Use Permit Boundary

3.4.2 Indicators for Analysis of Effects

The 2016 Forest Plan's desired conditions for biological resources seek "to guide future management in the preservation, enhancement, and, in some cases, restoration of biological resources." To achieve the desired conditions and objectives, the Forest Plan establishes a series of standards and guidelines. The following standards and guidelines are applicable to botanical resources:

Conservation of Species and Habitat

SG43. On a project specific basis, prescribe measures needed to provide for the diversity of plant and animal communities and support the persistence of native species. [Guideline]

SG44. During project development, evaluate the project area, including any designated critical habitat, for the habitat suitability and/or occurrence of TEPCS species. [Standard]

SG45. Implement Limited Operating Periods (LOPs) for TEPCS species and TRPA identified native species when determined necessary through biological review. [Standard]

SG51. Employ measures such as limited operating period (LOP), buffering, and flagging and avoiding to minimize negative impacts to known TEPCS populations and habitats. [Guideline]

SG52. Genetically appropriate native plant materials shall be given primary consideration in revegetation, rehabilitation, and restoration. [Guideline]

SG53. When planting to increase willow cover, plant in patches with a mean size of 4,000 square feet. [Guideline]

SG54. Design pesticide applications to avoid adverse effects on TEPCS species and their habitats. [Guideline]

SG55. Retain snags and coarse woody debris at high use areas including developed recreation, administrative and permitted sites after considerations have been made for defensible space, public health and safety, and other management objectives for the site. [Guideline]

SG59. To avoid removing or altering bank stabilizing vegetation, trees may be marked for removal (live or dead) within 5 feet of the bank edge of perennial or intermittent streams and lakes, only where fuel loads or stand densities exceed desired conditions and where CWD is at or above desired levels or where trees are a hazard to safe operations. [Standard]

SG63. Outside of WUI defense zones, salvage harvests are prohibited in California spotted owl PACs and known carnivore den sites unless a biological evaluation determines that the areas proposed for harvest are rendered unsuitable for the purpose they were intended by a catastrophic stand-replacing event. [Standard]

SG65. During project-specific analysis determine appropriate amount of coarse woody debris to provide for long-term habitat quality. Coarse woody debris is generally comprised of at least three downed logs per acre in varying stages of decay. [Guideline]

SG66. Manage snag levels during project specific analysis after consideration for public safety. Prioritize retention of medium- and large-diameter snags or live trees that exhibit form and/or decay characteristics regarded as important wildlife habitat (e.g., have substantial wood defect, teakettle branches, broken tops, large cavities in the bole, etc.). Retain snags as follows: [Guideline]

a) Red fir forest type and white fir-mixed conifer forest types – on average, strategically locate and retain six of the largest snags per acre (In the WUI, fewer snags may be retained.)
b) Jeffrey pine – on average, strategically locate and retain three of the largest snags per acre (In the WUI, fewer snags may be retained.)
c) Snags should be clumped and distributed irregularly across treatment units.
d) Snags with cavities are a priority for primary and secondary cavity nesters (e.g., mountain bluebirds, house wrens, and white breasted nuthatch). When snags are absent consider installation of nest boxes to benefit cavity nesters.
e) Consider multiple resource values to determine appropriate retention levels based on availability and project objectives.

Do not construct roads and trails within 1⁄4 mile of the top or base of known cliff nesting raptor sites. [Standard]

SG70. Design vegetation treatments to minimize potential for creating isolated late seral stands by maintaining habitat connectivity of late seral stands. [Guideline]

SG71. When marking trees in late seral habitats, consult with a wildlife biologist regarding tree marking guidance, to ensure that the highest quality resting, denning, nesting, and roosting trees are retained.[Standard]

Invasive Species Management (Aquatic and Terrestrial)

SG73. Incorporate prevention and control measures into project planning, management activities and operations to prevent new introductions or contribute to spreading of invasive species, and reduce impacts from existing infestations on NFS lands, or to adjacent lands and water bodies. [Standard]

SG74. When feasible, employ the following control measures, such as: [Guideline]

a) Use contract and permit clauses to require that the activities of contractors and permittees (including but not limited to special use permits, utility permits, pack stock operators) are conducted to prevent and control the introduction, establishment, and spread of aquatic and terrestrial invasive species.
b) Include invasive species prevention and control measures in mining plans of operation and reclamation plans.
c) When working in known invasive species infestations during project implementation, equipment and vehicles shall be cleaned before moving to other NFS lands.
d) Support partner agencies and their programs.
e) Use on-site materials where feasible, unless contaminated with invasive species.

SG75. Gravel, fill, topsoil, mulch, and other materials should be free of invasive species. [Guideline]

SG76. New infestations are inventoried and known infestations are prioritized and contained, controlled, or eradicated using an integrated management approach. [Standard]

Terrestrial

SG83. For projects involving ground disturbance, inventory project areas and adjacent areas (particularly access routes) for invasive plants. [Guideline]

SG85. Screen plant materials used in revegetation, rehabilitation, and restoration (seed, cuttings, whole plants) for invasive plant risks. Avoid the use of persistent non-native plants unless justified in project documentation. [Guideline]

SG86. All equipment and vehicles (Forest Service and contracted) used off-road during project implementation shall be cleaned and free of invasive plant material before moving into the project area. [Guideline]

SG87. Following emergency response guidelines, utilize washing stations at staging areas, base camps, or other incident locations, to clean soil, seeds, vegetative material, or other debris that could contain invasive plant material from off-road equipment and vehicles. [Guideline]

SG88. Avoid locating landings or staging areas within areas infested by invasive plants, including during project implementation, fire management activities, and other ongoing management and maintenance activities. If infested areas are the only feasible landing/staging areas, then treat infestations prior to use, except in emergency situations. [Guideline]

SG89. Minimize the size of staging and construction areas. Where feasible, reestablish vegetation on disturbed bare ground to reduce invasive species establishment. [Guideline]

SG90. Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when proposed vegetation treatments are likely to reduce habitat quality in suitable California spotted owl habitat with unknown occupancy. Designate California spotted owl PACs where appropriate based on survey results. [Standard]

SG91. Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when proposed vegetation treatments are likely to reduce habitat quality in suitable northern goshawk nesting habitat that is not within an existing California spotted owl or northern goshawk PAC. Suitable northern goshawk nesting habitat is defined based on the survey protocol. [Standard]

SG99. Design management activities (e.g., vegetation treatments, recreation or access expansion or improvements) to minimize potential for creating isolated PACs and HRCAs by maintaining habitat connectivity of the PACs/HRCAs with the adjacent forest. [Guideline]

Special Status Species Habitat Areas

SG100. Management actions are consistent with habitat and population recovery objectives outlined conservation strategies and recovery plans. [Guideline]

SG103. For projects proposed on the shorezone, barrier beach and backshore of Lake Tahoe that have the potential to affect Tahoe yellow cress plants or their suitable habitat, assess for Tahoe yellow cress prior to, but in the same year as, project implementation. [Guideline]

3.4.3 Analysis of Direct/Indirect Effects

3.4.3.1 No Action - Alternative 1

No new direct or indirect impact to botanical resources would occur under Alternative 1. Heavenly Mountain Resort would continue to operate under current conditions, including the ongoing implementation of mitigation measures as established in the 2007 MPA EIR/EIS/EIS and 2015 Epic Discovery Project EIR/EIS/EIS and associated Mitigation Monitoring Plans.

3.4.3.2 Proposed Action - Alternative 2

The Proposed Action has the potential to directly or indirectly affect four special-status species: Tahoe draba, Galena Creek rockcress, Austin's milkvetch and whitebark pine.

Tahoe Draba:
Trail widening, run hazard reduction, and snowmaking air and water pipeline relocation are proposed in close proximity of existing Tahoe draba populations near the California Trail, Dipper Express, and Tamarack Express. The proposed project would result in a direct impact to a total of 4.68 acres of occupied DRASA occurrence locations and impact between 350-400 individuals.

Run Hazard Reduction Direct Impacts:
Impacts to DRASA as a result of implementation of run hazard reduction projects will occur to 3.97 acres of occupied habitat as noted in Table 3 of the Biological Evaluation. Polygon OH-3 (Meteor) has one plant that was recorded in 2016 during pre-construction surveys and is located at the lower end of the proposed project. Polygon IH-2 (Cascade) intersects with occurrence DRASA2h at the lower terminus of the known location of DRASA on Cascade trail. The proposed implementation of IH-1 (California Trail) would have the largest impact to DRASA through the potential habitat modification of 3.95 acres of occupied DRASA habitat. The run hazard reduction projects have the potential to impact between 271 and 321 individuals. Construction activities including blasting of rocks, spreading of mulch, movement of downed woody debris, and use of the area by equipment and personnel. These activities have great potential to directly impact the existing DRASA and modify the habitat so as to not allow for suitable growing conditions for the species.

Ski Trail Widening Direct Impacts:
While the proposed ski trail widening project will not result in direct impacts to the ground surface through the removal of trees, impacts to DRASA may occur as a result of tree loss. Removal of trees over the snow will not likely have direct impacts on DRASA, cutting the stumps down to the desired height may result in trampling and disturbance to existing plants (70 total). Of the two trail widening polygons that intersect with known DRASA occurrences, IW-4 (Ridge Run) is located within the Tahoe Basin and OW-2 (Orion) is located outside the basin boundary.

Existing mitigation measure *7.5-16 Protect Tahoe Draba Populations within Heavenly Mountain Resort* requires the avoidance (in-basin projects) and protection (minimize loss for out-of-basin projects) of Tahoe draba within the Heavenly Mountain Resort. Therefore, if the proposed run hazard reduction and ski trail widening areas that intersect with known occurrences cannot avoid direct and indirect impacts to existing Tahoe draba individuals, populations or habitat and are located within the Lake Tahoe Basin, the portion of the projects that intersect the Tahoe draba populations must be avoided by siting proposed projects and activities away from known populations. The in-basin project polygons that, as proposed, do not avoid direct impacts to DRASA include a large portion of IH-1 (California Trail), and very small areas of IH-2 (Cascade) and IW-4 (Ridge Run). The proposed project description and mapping shall be revised to avoid the known occurrences and reduce the project areas accordingly so as to avoid impacts to DRASA.

The out-of-basin polygons OW-2 (Orion) and OH-3 (Meteor) shall avoid impacts to DRASA through the inclusion of exclusion zones around the known occurrences to protect the individuals. The existing mitigation measure *7.5-16 Protect Tahoe Draba Populations within Heavenly Mountain Resort (2015 Master Development Plan)*, require the use of fencing around known populations to protect Tahoe draba to be four feet in height and readily identifiable by construction crews.

Existing fencing along the summer roadways in the areas of Tahoe draba have been metal project stakes used to hold up a rope line. This rope line effectively prevents vehicular access in these areas, however human access is not deterred as guests have been observed within the closed area. The project would not increase summer human traffic, and therefore would not increase the potential for impacts to Tahoe draba in the form of habitat modification and trampling of individuals.

Galena Creek Rockcress:
There will be no direct effects to Galena Creek rockcress. The one known occurrence (ARRID6b) is located immediately adjacent to the existing summer roadway below the Comet Express chairlift. This occurrence was first discovered in 2008; however, subsequent surveys of the area in 2009, 2012 and 2013 have not located any plants. Recent surveys by LTBMU suggest that the plants (2 total) were destroyed during construction activities in 2009 (CNDDB 2014). Use of the existing summer roadway for construction activities will not result in any impacts to the site as no vehicles are allowed off the roadway into the surrounding suitable habitat. There are minimal risks of loss or alteration of suitable habitat for Galena Creek rockcress. Additional summer visitor use to this area would not occur under the Proposed Action. Tree removal may be beneficial for Galena Creek rockcress, as it may provide more open forest areas and expand suitable habitat.

Austin's Milkvetch:
A population of Austin's milkvetch (*Astragalus austiniae*) was located in 2016 during rare plant surveys. Austin's milkvetch is included in the CNPS Inventory of Rare and Endangered Plants on list 1B.3 (rare, threatened, or endangered in CA and elsewhere). The location of the population is in the upper portion of Sam's Dream ski trail (IH-3). The proposed project has the potential to result in direct impacts (loss of approximately 150 individuals / 0.06 acres) through disturbance during project implementation. In accordance with Mitigation Measure 7.5-15 Minimize Loss/Degradation of Sensitive Plant Species, Heavenly shall create a 100 meter buffer around the known occurrence in order to avoid impacts to the species. No indirect impacts to the species is expected as a result of the proposed project, as summer use of the area is not proposed.

Whitebark Pine:
Direct impacts to whitebark pine will result due to direct removal of individuals as a result of trail widening. Trail widening on the ski trails listed in Table 10 would result in the potential removal of whitebark pine. The only projects that are proposed to occur in portions of whitebark dominant stands are IW-1 (49er), IW-2 (Sam's Dream), IW-4 (Ridge Run), OW-2 (Orions), OW-3 (Big Dipper) totaling 6.41 acres. The remaining projects are located in mixed stands that contain whitebark pine. Small fixed radius plots were taken in each of the ski trial widening polygons. The data collected from these sample plots were used to then estimate the trees for removal by species and size for each polygon. These estimates are considered to be very conservative given the small size of the fixed plot used for the data collection.

Table 10. 2017 Capital Improvement Trail Widening Resulting in Whitebark Pine Removal

Polygon # (Trail)	Acres of Trail Widening	Estimated Number of Whitebark Pine to be removed (all stems)	Estimated Number of Whitebark Pine to be removed (>6" dbh)
IW-1	0.3	66	0
IW-2	1.2	281	95
IW-3	0.3	150	30
IW-4	2.9	420	290
IW-7	0.5	30	30
OW-1	3.3	438	252
OW-2	10.9	2722	1904
OW-3	1.2	600	240
OW-4	3.2	64	0
TOTAL	23.8	4771	2841

Indirect effects to whitebark pine were evaluated by assessing whether or not the project would contribute to the threats numerated in the federal listing of whitebark pine as a Candidate species – namely fire, disease, and climate change (USFWS 2011).

Fire and Fire Suppression:
Potential impacts to local whitebark pine populations and stands exist from the threat of catastrophic wildfire. A wildfire within Heavenly's Special Use Permit Boundary could impact a large number of whitebark pine. Additionally, over time, fire suppression activities have resulted in the increase in shade tolerant conifer species within whitebark pine stands (USFWS 2011). This change in structure and composition facilitates the increased severity and frequency of wildfire that could result in a stand replacing event and result in the loss of genetic diversity necessary for the species survival in the region. Implementation of the 2017 Capital Improvement Project would result in a temporary increase in human activity and construction in the forested environment at Heavenly Mountain Resort. This increase in activity in the forest increases the chances for wildfire. The existing snowmaking system can be utilized in the event of a wildfire in the area. Heavenly Mountain Resort has a strict management directive that prohibits smoking in their facilities or in outdoor areas (Operations Plan), which diminishes the potential for fires from guest activities.

Disease:
By far the largest threat to whitebark pine is from disease in the form of nonnative white pine blister rust. The white pine blister rust (*Cronartium ribicola*) occurs throughout the range of whitebark pine and results in the mortality of infected individuals of all age classes. Typically, white pine blister rust (WPBR) kills cone-bearing branches and seedlings. The existing mortality rate due to WPBR infection is expected to be as high as 57% by 2110 (USFWS 2011). It should be noted a small percentage of whitebark pine are naturally resistant to infection from WPBR and the potential loss of these individuals may result in the genetic material necessary to stave off extreme levels of WPBR infection. Whitebark pine is also currently being impacted by predation from the mountain pine beetle (*Dendroctonus ponderosae*). The combination of impacts from white pine blister rust and mountain pine beetle result in loss to seed cone production. Mountain pine beetle target and kill larger trees that produce the largest number of cones. White pine blister rust often kills cone-bearing branches. Together these impacts to seed cone production can decrease the fecundity of the species.

Removal of healthy whitebark pine trees from the area could result in a loss of important genetic diversity necessary to promote disease resistance. "Plus trees" are healthy trees that are potentially resistant to infection from the white pine blister rust (*Cronartium ribicola*). They are identified through field surveys by plant pathologists, which have not occurred in advance of proposed activities. As such, there is the potential to remove plus trees during the proposed tree removal. If plus trees are removed, their genetic contribution is permanently lost and could reduce the overall stand resistance to white pine blister rust. However, the Whitebark Pine Partnership Action Plan includes suggested actions that involve the identification and protection of plus trees.

Climate Change:
Whitebark pine typically occurs in cold, exposed high-elevation sites. The increase in temperature that is likely to occur as a result of climate change will result in the decrease in suitability of current habitats for whitebark pine through the loss of soil moisture (Hamman and Wang 2006, Schrag et al. 2007, Aitken et al. 2008). Suitable habitat loss could occur through the overall increase in temperature resulting in the species unable to survive or the increase in competition from other conifer species currently adapted to warmer temperatures. As temperatures increase the area of available habitat decreases at high elevations due to limited space on mountain tops. Increased temperatures also have a positive effect on the mountain pine beetle's life cycle which under warm temperatures can be completed in one year. The proposed project actions will not result in any significant changes in climate (see Chapter 3.4, Air Quality and Climate Change in the Epic Discovery EIS) and therefore will not increase the climate change risk factor on whitebark pine.

3.4.4 Cumulative Effects

Tahoe Draba:
The project has the potential to affect seven percent (3 of 41 total) of the known sub-occurrences on the LTBMU. A total of eight element occurrences are known for Tahoe draba in the basin. Of the eight, two may be recognized as a separate variety located on Relay Peak and Mt. Rose, thereby reducing the variety located at Heavenly Mountain Resort down to six. At least one other element occurrence is currently located within a ski resort located at Mt. Rose Ski Tahoe. As such, it is imperative to protect existing individuals. The design features in Section 2.3 of the EA are sufficient to alleviate impacts both directly through avoidance (Project avoidance and fencing) and indirectly through decreases in habitat modification. There would be no cumulative effects from the proposed action because the direct and indirect effects are expected to be negligible with inclusion of design features and future 2007 MPA

phases do not include activities in the areas of the known Tahoe draba populations. As long as existing management guidelines (e.g. field surveys, protection of known occurrences, and invasive plant mitigations) remain in place, the effects of future projects on Tahoe draba would likely be minimal or similar to those described in this analysis.

Austin's Milkvetch:
There would be no cumulative effects from the proposed action because the direct and indirect effects are expected to be negligible. As long as existing management guidelines (e.g. field surveys, protection of known occurrences, and invasive plant mitigations) remain in place, the effects of future projects on Austin's Milkvetch would likely be minimal or similar to those described in this analysis.

Galena Creek Rockcress:
There would be no cumulative effects from the proposed action because the direct and indirect effects are expected to be negligible. As long as existing management guidelines (e.g. field surveys, protection of known occurrences, and invasive plant mitigations) remain in place, the effects of future projects on Galena Creek rockcress would likely be minimal or similar to those described in this analysis.

Whitebark Pine:
Even though whitebark pine occurs throughout mountain ranges of the western United States, the relative isolation of populations of the Sierra Nevada from the core distribution in the northern Rockies warrants consideration of effects at the unit rather than range scale. In the context of the estimated abundance of whitebark pine on LTBMU—between 1,500-24,000 acres (Section 5.4.1.3), the removal of 6.41 acres of whitebark dominant stands (23.8 acres of forested area containing whitebark pine) does not threaten the viability of LTBMU's whitebark pine population. In terms of acreage, using either the EVeg or TEUI estimated acreage, the percentage of the LTBMU population disturbed by the project represents less than 0.001%. Although it represents the best available science, this estimate of relative affected area should be considered in the context of the low accuracy of the LTBMU abundance estimates; there remains a high degree of uncertainty about the abundance and distribution of whitebark pine on LTBMU.

There is even greater uncertainty regarding the health of LTBMU's whitebark pine stands. Other than aerial detection surveys (FHP 2012), there has not been a unit-wide assessment of whitebark pine health. The project area and associated tree removal is in an area of relatively low white pine blister rust incidence (Maloney et al. 2012). It is unclear how the removal of healthy trees may hinder or enhance stands exhibiting low WPBR incidence. In the absence of comprehensive stand condition data, it is difficult to quantify what effect the removal of 6.41 acres of whitebark dominant stands (23.8 acres of forested area containing whitebark pine will have on the LTBMU's whitebark population at the unit scale. Inclusion of resource protection measures in the project will allow for protection and conservation of high quality stands within the Special Use Permit Boundary. Collection of seeds and cones from "Plus Trees" and regeneration efforts combined with long-term monitoring will allow for the continued study and protection of whitebark pine within Heavenly Mountain Resort. Any plus trees shall be identified and seeds collected prior to removal of whitebark pine for the Project.

Past projects prior to the Epic Discovery Project did not specifically analyze effects to whitebark pine in the botany analysis area, as it only became a candidate for listing under ESA in late 2011 and on the R5 Sensitive species list in 2013. However, the past construction of facilities and ski trails has undoubtedly resulted in removal of individual whitebark pine trees, as evidenced by the existence of numerous runs through whitebark pine stands.

Future projects will undergo site-specific analysis and be subject to the resource protection measures outlined in the 2015 MPA, which include a TEPCS survey requirement and provisions to add additional mitigation measures for TEPCS species. Table 11 summarizes the TEPCS botanical species determinations.

Table 11. Summary of TEPCS Botanical Species Determinations

Scientific Names	Common Name	Project Effect*
Boechera rigidissima	Galena Creek rockcress	MANL
Botrychium ascendens	upswept moonwort	WN
Botrychium crenulatum	scalloped moonwort	WN
Botrychium lineare	slender moonwort	WN
Botrychium lunaria	common moonwort	WN
Botrychium minganense	Mingan's moonwort	WN
Botrychium montanum	western goblin	WN
Dendrocollybia racemosa	Dendrocollybia	WN
Draba asterophora var. macrocarpa	Cup Lake draba	WN
Draba cruciata	Mineral King draba	WN
Draba asterophera var. asterophera	Tahoe draba	MANL
Erigeron miser	Starved daisy	WN
Eriogonum umbellatum var. torreyanum	Donner Pass buckwheat	WN
Helodium blandowii	Blandow's bogmoss	WN
Hulsea brevifolia	shortleaf hulsea	WN
Lewisia kelloggii ssp. Hutchinsonii	Sierra Valley lewisia	WN
Lewisia kelloggii ssp. Kelloggii	Kellogg's lewisia	WN
Peltigera gowardii	Western waterfan	WN
Pinus albicaulis	Whitebark pine	MANL

*WN—The project will not affect the species;
MA(NL)—The project may affect but is not likely to result in a trend toward (or accelerate) Federal listing or a loss of viability for the species;
MA(LL)—The project may affect individuals, and is likely to result in a trend toward (or accelerate) Federal listing or a loss of viability for the species.

3.4.5 Analytical Conclusions

The Proposed Action may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability of Tahoe draba (*Draba asterophora* var. *asterophora*). This determination is based on the negligible direct and indirect effects to individuals and areas of suitable habitat.

The Proposed Action may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability of Austin's milkvetch (*Astragalus austiniae*). This determination is based on the negligible direct and indirect effects to individuals and areas of suitable habitat.

The Proposed Action may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability of Galena Creek rockcress (*Arabis rigidissima var. demota*). This determination is based on the negligible direct and indirect effects (increased human disturbance resulting in trampling or vehicular travel) to individuals and areas of suitable habitat. These potential effects are currently

regulated through existing mitigation measures outlined in the 2015 Master Development Plan Mitigation and Monitoring Plan.

The Proposed Action may affect individuals, but is not likely to accelerate the trend toward Federal listing or result in loss of viability for whitebark pine (*Pinus albicaulis).* This determination is based on the fact that individual whitebark pine trees will be permanently removed, but the acreage of removal constitutes a very small portion of the estimated LTBMU whitebark pine population; and the threats to whitebark pine that contributed to its consideration for federal listing are adequately addressed through resource protection measures identified in the Partnership Action Plan.

Although the No Project Alternative (Alternative 1) results in no new direct, indirect, or cumulative impact on botanical resources, it does not meet the objectives of the project or improve the user experience at Heavenly Mountain Resort. While the Proposed Action would affect botanical resources through disturbance or removal, the adopted mitigation measures as outlined in the Mitigation Monitoring Plan for Heavenly Mountain Resort (HMR 2015) address and either avoid or minimize this disturbance. Impacts to botanical species would not result in adverse change towards federal listing or loss of viability.

3.5 Wildlife

This analysis is tiered to the 2016 Forest Plan and incorporates by reference the 2007 EIR/EIS/EIS and 2015 Epic Discovery EIR/EIS/EIS. Please refer to the wildlife and vegetation sections of those documents for a detailed description of the affected environment of Heavenly's SUP boundary and detailed background and setting data. In addition, the EA prepared for the 2017 Capital Improvements Project provides background information and analysis of project impacts on wildlife.

3.5.1 Background

The project site can be characterized as a managed recreation ski resort with a stand of coniferous trees interspersed. Elevations within the project area range from 8,000 feet to 10,000 feet. The dominant plant community in the Project area is a mix of mixed conifer-fir association, white bark pine association, and lodgepole pine association. The major species within these associations include white fir (*Abies concolor*), lodgepole pine (*Pinus contorta*), western white pine (*Pinus monticola*), and whitebark pine (*Pinus albicaulis*). Understory species that typically occur in tree dominated associations are tobacco brush (*Ceanothus velutinus*), mountain whitethorn (*Ceanothus cordulatus*), and pinemat manzanita (*Arctostaphylos nevadaensis*). For a detailed description of the existing environment please refer to Chapter 3.8 Vegetation and Chapter 3.9 Wildlife and Fisheries in the *Heavenly Mountain Resort Master Plan Amendment Final EIS and the Heavenly Mountain Resort Epic Discovery EIS* (Hauge Brueck Associates 2007 and 2015 respectively).

Federally listed Terrestrial Wildlife Species Pursuant to ESA:

Proposed Threatened:

- California wolverine (*Gulo gulo luteus*)[1]

[1] Currently accepted taxonomy classifies wolverines as *Gulo gulo* and those in the contiguous U.S. as part of the New World subspecies, *G. g. luteus* (USFWS, Federal Registrar - FWS-R6-ES-2012-0107: 4500030113, February 4, 2013).

Candidate:

- Pacific Fisher (*Martes pennanti*)

Region 5 Forest Service Sensitive Terrestrial Wildlife Species:

Mammals

- California wolverine (*Gulo gulo luteus*)
- Sierra Nevada red fox (*Vulpes vulpes necator*)
- American marten (*Martes americana*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- Pallid bat (*Antrozous pallidus*)
- Fringed myotis (Myotis thysanodes)

Birds

- Bald Eagle (*Haliaeetus leucocephalus*)
- Northern Goshawk (*Accipiter gentiles*)
- California Spotted Owl (*Strix occidentalis occidentalis*)
- Great Gray Owl (*Strix nebulosa*)
- Willow Flycatcher (*Empidonax traillii adastus*)

Invertebrates

- Western bumble bee (*Bombus occidentalis*)

The Heavenly Special Use Permit Area is outside the geographic range of the Pacific fisher and California wolverine. Therefore, effects to these species would not occur and these species will not be further discussed and thus have a determination of "No Effect" for this project.

The distribution and habitat associations of the special-status species were reviewed using records from Heavenly annual wildlife surveys, Pacific Southwest Research Station, and LTBMU-wide wildlife program surveys, current range maps for species, and GIS data and aerial imagery for habitat types in the Project area. Following the review, several species were excluded from further analysis because the Project areas are collectively outside the current range of these species and/or there is no suitable habitat in or within 0.5 mile of the Project areas. The species excluded from further analysis include great gray owl, North American wolverine, willow flycatcher, Lahontan Lake tui chub, and Great Basin rams-horn. There is no suitable habitat for Great gray owl, willow flycatcher, Lahontan Lake tui chub, and Great Basin rams-horn in or within 0.5 mile of the Project areas and no known occurrences of the species in or within 0.5 mile of the Project areas. Sierra Nevada red fox, and California wolverine are not currently known to occur in the LTBMU and are not evaluated for potential effects from project activities.

Sensitive species surveys performed before approval of the 1996 Master Plan are described in the *Draft Heavenly Ski Resort Master Plan EIR/EIS/EIS* (Harland Bartholomew & Associates, Inc. 1995). Annual surveys after approval of the 1996 Master Plan have been performed for California spotted owl and northern goshawk. Surveys were conducted utilizing habitat that was identified in the 1995 *Draft EIR/EIS*. Surveys and results since 1996 are briefly described in the Biological Evaluation prepared for this project and is on file at the Lake Tahoe Basin Management Unit, Supervisor's Office. Habitat maps for these species were updated along with the 2007 *Master Plan Amendment EIS* and were used for

surveys conducted since its preparation. Pacific marten surveys have occurred, but not on an annual basis.

Species accounts and occurrence information for bald eagle, spotted owl, northern goshawk, American marten, western bumble bee, Sierra Nevada yellow-legged frog, and the three sensitive bat species (Fringed, Pallid, Townsend's big-eared) are provided in detail in the Biological Evaluation prepared for this project as discussed above.

3.5.2 Indicators for Analysis of Effects

The 2016 Forest Plan's desired conditions for biological resources seek "to guide future management in the preservation, enhancement, and, in some cases, restoration of biological resources." To achieve the desired conditions and objectives, the Forest Plan establishes a series of standards and guidelines. The following standards and guidelines are applicable to wildlife resources:

Conservation of Species and Habitat

SG43. On a project specific basis, prescribe measures needed to provide for the diversity of plant and animal communities and support the persistence of native species. [Guideline]

SG44. During project development, evaluate the project area, including any designated critical habitat, for the habitat suitability and/or occurrence of TEPCS species. [Standard]

SG45. Implement Limited Operating Periods (LOPs) for TEPCS species and TRPA identified native species when determined necessary through biological review. [Standard]

SG47. Decontaminate field clothing and gear prior to entering and when moving between cave habitats to prevent the spread of pathogens and disease. [Guideline]

SG51. Employ measures such as limited operating period (LOP), buffering, and flagging and avoiding to minimize negative impacts to known TEPCS populations and habitats. [Guideline]

SG52. Genetically appropriate native plant materials shall be given primary consideration in revegetation, rehabilitation, and restoration. [Guideline]

SG54. Design pesticide applications to avoid adverse effects on TEPCS species and their habitats. [Guideline]

SG55. Retain snags and coarse woody debris at high use areas including developed recreation, administrative and permitted sites after considerations have been made for defensible space, public health and safety, and other management objectives for the site. [Guideline]

SG56. When facilities at developed recreation sites that are located in or adjacent to wetlands suitable for waterfowl nesting are opened between March 1 and June 30, implement appropriate actions (e.g., signing) to manage impacts from recreation (e.g., dogs) to maintain a low level of human disturbance on nesting waterfowl. [Guideline]

SG63. Outside of WUI defense zones, salvage harvests are prohibited in California spotted owl PACs and known carnivore den sites unless a biological evaluation determines that the areas proposed for harvest are rendered unsuitable for the purpose they were intended by a catastrophic stand-replacing event. [Standard]

SG64. Evaluate the need for ecological restoration following disturbances unrelated to fire (e.g., avalanches, windthrow, flooding, insect outbreaks, disease). Give priority to public safety first and then to wildlife habitat (including retention of habitat), soils, vegetation, water quality, and invasive species. [Guideline]

SG65. During project-specific analysis determine appropriate amount of coarse woody debris to provide for long-term habitat quality. Coarse woody debris is generally comprised of at least three downed logs per acre in varying stages of decay. [Guideline]

SG66. Manage snag levels during project specific analysis after consideration for public safety. Prioritize retention of medium- and large-diameter snags or live trees that exhibit form and/or decay characteristics regarded as important wildlife habitat (e.g., have substantial wood defect, teakettle branches, broken tops, large cavities in the bole, etc.). Retain snags as follows: [Guideline]

a) Red fir forest type and white fir-mixed conifer forest types – on average, strategically locate and retain six of the largest snags per acre (In the WUI, fewer snags may be retained.)
b) Jeffrey pine – on average, strategically locate and retain three of the largest snags per acre (In the WUI, fewer snags may be retained.)
c) Snags should be clumped and distributed irregularly across treatment units.
d) Snags with cavities are a priority for primary and secondary cavity nesters (e.g., mountain bluebirds, house wrens, and white breasted nuthatch). When snags are absent consider installation of nest boxes to benefit cavity nesters.
e) Consider multiple resource values to determine appropriate retention levels based on availability and project objectives.

Do not construct roads and trails within 1⁄4 mile of the top or base of known cliff nesting raptor sites. [Standard]

SG68. Prohibit activities, such as rock climbing near occupied cliff nesting raptor sites during the nesting season (April 1-July 31), as needed to protect individuals. Determine buffer distance based on nest location, nesting pair behavior, and cliff features that either expose or visually/audibly shield the nest from disturbance. [Standard]

SG70. Design vegetation treatments to minimize potential for creating isolated late seral stands by maintaining habitat connectivity of late seral stands. [Guideline]

SG71. When marking trees in late seral habitats, consult with a wildlife biologist regarding tree marking guidance, to ensure that the highest quality resting, denning, nesting, and roosting trees are retained. [Standard]

SG72. Marten den sites are 100-acre buffers consisting of the highest quality habitat in a compact arrangement surrounding the den site. CWHR types 6, 5D, 5M, 4D, and 4M in descending order of

priority, based on availability provide highest quality habitat for the marten. Mitigate impacts where there is documented disturbance to the den site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites. [Standard]

Invasive Species Management

SG73. Incorporate prevention and control measures into project planning, management activities and operations to prevent new introductions or contribute to spreading of invasive species, and reduce impacts from existing infestations on NFS lands, or to adjacent lands and water bodies. [Standard]

SG74. When feasible, employ the following control measures, such as: [Guideline]

a) Use contract and permit clauses to require that the activities of contractors and permittees (including but not limited to special use permits, utility permits, pack stock operators) are conducted to prevent and control the introduction, establishment, and spread of aquatic and terrestrial invasive species.
b) Include invasive species prevention and control measures in mining plans of operation and reclamation plans.
c) When working in known invasive species infestations during project implementation, equipment and vehicles shall be cleaned before moving to other NFS lands.
d) Support partner agencies and their programs.
e) Use on-site materials where feasible, unless contaminated with invasive species.

SG75. Gravel, fill, topsoil, mulch, and other materials should be free of invasive species. [Guideline]

SG76. New infestations are inventoried and known infestations are prioritized and contained, controlled, or eradicated using an integrated management approach. [Standard]

Terrestrial

SG83. For projects involving ground disturbance, inventory project areas and adjacent areas (particularly access routes) for invasive plants. [Guideline]

SG85. Screen plant materials used in revegetation, rehabilitation, and restoration (seed, cuttings, whole plants) for invasive plant risks. Avoid the use of persistent non-native plants unless justified in project documentation. [Guideline]

SG86. All equipment and vehicles (Forest Service and contracted) used off-road during project implementation shall be cleaned and free of invasive plant material before moving into the project area. [Guideline]

SG87. Following emergency response guidelines, utilize washing stations at staging areas, base camps, or other incident locations, to clean soil, seeds, vegetative material, or other debris that could contain invasive plant material from off-road equipment and vehicles. [Guideline]

SG88. Avoid locating landings or staging areas within areas infested by invasive plants, including during project implementation, fire management activities, and other ongoing management and maintenance activities. If infested areas are the only feasible landing/staging areas, then treat infestations prior to use, except in emergency situations. [Guideline]

SG89. Minimize the size of staging and construction areas. Where feasible, reestablish vegetation on disturbed bare ground to reduce invasive species establishment. [Guideline]

SG90. Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when proposed vegetation treatments are likely to reduce habitat quality in suitable California spotted owl habitat with unknown occupancy. Designate California spotted owl PACs where appropriate based on survey results. [Standard]

SG91. Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when proposed vegetation treatments are likely to reduce habitat quality in suitable northern goshawk nesting habitat that is not within an existing California spotted owl or northern goshawk PAC. Suitable northern goshawk nesting habitat is defined based on the survey protocol. [Standard]

SG97. Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites. [Standard]

Special Status Species Habitat Areas

SG100. Management actions are consistent with habitat and population recovery objectives outlined conservation strategies and recovery plans. [Guideline]

3.5.3 Analysis of Direct/Indirect Effects

3.5.3.1 No Action - Alternative 1

If no action occurs (Alternative 1), no new direct or indirect impact to wildlife would occur. Heavenly Mountain Resort would continue to operate under current conditions, including the ongoing implementation of mitigation measures as established in the 2007 MPA EIR/EIS/EIS and 2015 Epic Discovery Project EIR/EIS/EIS and included in the 2015 Master Development Plan Mitigation Monitoring Plan.

3.5.3.2 Proposed Action - Alternative 2

Bald Eagle

This project would not affect the bald eagle. Although suitable habitat exists within the Special Use Permit Boundary, no observations of this species have been recorded during wildlife surveys conducted during 1991-2017 for northern goshawk, nesting birds, marten and other miscellaneous survey activities. Incidental sightings of this species at Heavenly have not been reported. The project would not

affect suitable habitat for this species as all proposed ski trail widening project that remove 30 inch dbh trees are not located immediately adjacent to existing water bodies.

California Spotted Owl

The project may affect suitable habitat and individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the California spotted owl. The removal of trees to create the widened ski trails will result in the direct loss of suitable foraging habitat for California spotted owls. However, as no owls have been detected in the vicinity of any of the 2017 Capital Improvement Projects the likelihood of foraging California spotted owls within the project area is minimal. The removal of trees will not disturb nesting owls as no nests have been discovered during annual owl surveys (1993-present). Although no owls have been observed within the resort operational boundary, owl activity within the special use boundary but outside the operational boundary was observed in 2003. Indirect impacts to foraging spotted owls may result from temporary increased human presence within the Project area in suitable foraging habitat as a result of project implementation. Ski trail widening will result in the direct removal of 2.16 acres of suitable foraging habitat.

Northern Goshawk

The removal of trees to create the widened ski trails noted above will result in the direct loss of suitable habitat for northern goshawk. While no northern goshawk have been detected within the project area, the proposed project will result in the removal of suitable foraging habitat. The ski trail widening will result in direct impacts to 2.16 acres of northern goshawk habitat through project implementation of ski trail widening through tree removal. As there is 2,226 acres of northern goshawk habitat in the Special Use Permit Area (MPA 05 EIR/EIS/EIS 2007), the removal of 2.16 acres of habitat results in a loss of 0.001% of suitable habitat. Indirect impacts to foraging northern goshawk may result from increased human presence in the Project areas during project implementation.

Overall the Project or Alternatives may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for Northern goshawk.

American Marten

The 2017 Capital Improvement Projects may remove 25.3 acres of suitable forging habitat (as a result of tree removal). Temporary and permanent ground disturbance will result in a larger area as noted in Tables 1 and 2 above. The 2017 Capital Improvement Projects will result in a total disturbance area of 41.9 acres resulting from run hazard reduction projects, although 6.1 acres of total run hazard reduction projects would be concurrent with run widening. Marten have been found throughout Heavenly and currently appear to coexist with the large number of visitors that also use the site in the winter due to marten using the edges of the ski resort. Current research will look at marten coexisting with visitors in the summer.

The 2009-2011 Basin study found female reproductive habitat areas where young are produced are critical for maintenance of the overall population. Areas used for reproduction were stable and did not change annually which suggests that reproductive habitat is a limiting factor for marten populations (Slauson et al 2017). Thus the maintenance of existing suitable reproductive habitat is one of the most critical factors for maintaining marten populations and distributions. An indirect effect of this project will be increased human disturbance closer to the successful female reproductive habitat as a result of

construction activities associated with the project. The proposed action will increase the impacts to existing habitat conditions (direct removal), increase human traffic in the area during implementation (summer season after the young are born) and increase the noise from both humans and equipment. The increased human presence during the summer months also coincides with marten breeding activity. These impacts will be minimized with implementation of Design Features that are listed above notably WL-3 that require the project area be surveyed for den sites before construction activities.

Through disturbance of reproductive habitat and increased human presence, the Project may have an impact on marten. Incorporation of Design Feature WL-3 will requrie surveys for den sites prior to comencement of construction and therefore will reduce impacts to den locations. Increased human presence may have an impact to individuals however the speices within the operational boundary of the resort has become aclimated to humans and their built enviornment. The project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for Pacific marten.

Sierra Nevada Yellow-Legged Frog

The project will not affect Sierra Nevada yellow-legged frog and will not affect critical habitat for the species because all project activities are outside suitable habitat and critical habitat. Furthermore, protocol-level surveys in suitable habitat surrounding the project area did not detect any individuals. The determination for the SNYLF is listed in the Federal Species section of this biological assessment/biological evaluation for the proposed project or Alternatives.

Townsend's big-eared bat, Fringed Myotis bat, and Pallid bat

Suitable roosting habitat exists within the Project area in the form of large trees, snags and rock outcrops. Fringed myotis and pallid bat have been detected in the Spooner Summit (7,400) area to the north of Heavenly Mountain Resort. A roost of Townsend's big-eared bats was detected in XXXX in the Skunk Harbor area on the east shore of Lake Tahoe. Although no surveys have been performed in the Project area, the suitability of the surrounding habitat of the proposed projects leaves the possibility open for these species to be disturbed by project implementation. The projects that contain suitable habitat include those with large trees and snags. All three species are sensitive to human disturbance while roosting and may roost under the bark of the large trees that are proposed for removal. Inclusion of Design Feature WL-7 will decrease the impacts to roost sites.

Overall the Project or Alternatives may affect suitable individuals, but is not likely to result in a trend toward Federal listing or loss of viability for fringed myotis and pallid bat.

Western bumble bee

Suitable foraging areas for western bumble bee are not located in the ski trails that are proposed to be widened and/or modified through implementation of the run hazard reduction prescription. The relative low level of impact and vegetation removal that is required for the projects are not likely to result in the loss of individuals and will not result in a large loss of flowering plants that could offer potential nectar sources to this species.

The Proposed Project or Alternatives will not affect Western bumble bee.

3.5.4 Cumulative Effects

Since Alternative 1 would result in no change in the current conditions and practices, it would not contribute to a cumulative effect.

Past, present and reasonable foreseeable future management of the area surrounding the Heavenly special use permit area on USFS and other lands within the Burke Creek, Edgewood Creek, Bijou Park Creek, Cold Creek, Trout Creek, Mott, and Heavenly Valley Creek watersheds, were analyzed to determine if a cumulative effect would exist when combined with the 2017 Capital Improvement projects.

Cumulative timber losses that occur as a result of fire within and adjacent to the project vicinity would reduce available habitat for associated wildlife species and would compound the effects of the Proposed Action or Alternatives. Lightning is the primary cause of fires in the upper elevations, while human-caused fires are more prevalent in the lower elevation areas that are more accessible to the public. With the exception of one fire near the gondola lift line that burned approximately 670 acres, all of the fires were less than two acres in size. The entirety of the Gondola Fire was inside Heavenly's Special Use Permit Boundary and resulted in loss of suitable habitat for the northern goshawk. In the Toyaibe National Forest, only a few small fires (less than one-quarter acre) have been recorded within 1.5 miles of the Special Use Permit Boundary in the past 20 years (Bailey 2005). The increase of human use of the area as a result of the proposed project may result in an increase in chances of fires within the project area.

Timber thinning practices established by the Forest Service's Land Management Plan require the harvest of excess or unwanted trees within accessible immature stands where the cut trees can be harvested for consumptive purposes. The primary purposes of thinning are to maintain optimum growing conditions to assure healthy trees and to reduce the potential for rapid and intensive wildfire spread due to excessive fuel loading. This additional loss of habitat would compound the habitat lost due to recreational activity construction at Heavenly Mountain Resort.

Timber thinning as noted above on National Forest, in combination with tree removal associated with build-out of the proposed Heavenly Master Plan Amendment (EIR/EIS/EIS 2007) in the Wells Fargo area (below Galaxy ski lift), could reduce available habitat for wildlife species that inhabit mid-to-late successional forest land with a high percentage canopy closure.

The timber management practice standards and guidelines contained within the LTBMU LMP (2016) require that timber cuts be planned based on land allocations to insure prevention of destruction from wildlife and to preserve benefits for vegetative diversity, wildlife habitat, visual quality, recreation opportunities and watershed protection. Based on TRPA and Forest Service regulations, the enhancement of older stands would continue in the Lake Tahoe Basin and would result in an overall increase of late seral forest types associated with sensitive species habitat over time.

Van Sickle Bi-State Park is located on either side of the state line to the southeast of the South Lake Tahoe casino core area. This bi-state park provides day use activities such as hiking, nature walks and an interpretive center. In addition, overnight camping for automobiles, recreational vehicles and walk in sites are planned. Hiking trails have been constructed connecting the Van Sickle base area to the Tahoe Rim trail resulting in increased human presence in the area. Increased loss of suitable habitat for

wildlife species and increased human disturbance/activity in the project area have resulted from implementation of Van Sickle State Park.

Additional recreational pressures on biological resources have occurred due to the opening of backcountry gates at Heavenly Mountain Resort in 2005 and the addition of a new gate located in Von Schmidt's flat in 2013 and other potential new gates to access backcountry areas adjacent to the ski resort operational boundary. A total of four winter access gates have been opened which allow skiers to cross the boundary of the resort to access terrain which is not patrolled or controlled. While these areas were previously used, the provision of official access has resulted in increased use of the area and may result in compounded pressures on wildlife species by decreasing the suitability of habitat in the winter and spring months when skiers are active. Continued operation of the existing backcountry gates may require tree removal or other habitat modifications that could result in the loss or degradation of wildlife habitat functions and values within the vicinity of the Heavenly Mountain Resort. In addition to a possible reduction in the total acreage of wildlife habitat, adverse effects may include: habitat fragmentation, creation of increased edge habitat and concomitant increases in associated impacts, and creation of barriers to wildlife migration and daily movement patterns. Each of these effects have the potential to result in a reduction in the numbers and diversity of sustainable wildlife habitats although it is unlikely these projects would result in impacts to sensitive or native wildlife populations such that their numbers decrease to levels that would warrant listing.

3.5.5 Analytical Conclusions

Alternative 1 (No Action) is superior since it results in no change to the current habitat conditions and would not result in any direct loss to individuals or habitat, or indirect effect. However, Alternative 1 would not achieve the proposed objectives. The Proposed Action will not affect bald eagle or western bumble bee, but may affect suitable habitat or individuals of Northern goshawk, California spotted owl, Pacific marten, fringed myotis, Townsend's big-eared bat or pallid bat. The Proposed Action would not result in a trend toward Federal listing or loss of viability for these species, yet the potential to directly or indirectly affect these species remains present. Project disturbance would occur in areas that are currently disturbed or directly adjacent to cleared and utilized areas, making the value of the habitat less desirable due to existing human presence and vegetation fragmentation.

3.6 Fisheries and Aquatic Resources

This analysis is tiered to the 2016 Forest Plan and incorporates by reference the 2007 EIR/EIS/EIS and 2015 Epic Discovery EIR/EIS/EIS. Please refer to the wildlife and vegetation sections of those documents for a detailed description of the affected environment of Heavenly's SUP boundary and detailed background and setting data. In addition, the EA prepared for the 2017 Capital Improvements Project provides background information and analysis of project impacts on fisheries and aquatic resources.

3.6.1 Background

Federally listed Aquatic Species Pursuant to ESA

Endangered

- Sierra Nevada Yellow-legged Frog (*Rana sierrae*)

Threatened

- Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi)*
- Yosemite toad (*Anaxyrus canorus*)

Region 5 Forest Service Sensitive Aquatic Species

Amphibians

- Sierra Nevada yellow-legged frog (*Rana sierrae*)

Fish

- Lahontan Lake tui chub (*Gila bicolor pectinifer)*

Invertebrates

- Great Basin rams-horn (*Helisoma (Carninifex) newberryi*)

The LTBMU is outside the geographic range of the Yosemite toad. Therefore, effects to this species would not occur and will not be further discussed and thus have a determination of "No Effect" for this project.

Following the review, several species were excluded from further analysis because the Project areas are collectively outside the current range of these species and/or there is no suitable habitat in or within 0.5 mile of the Project areas. The species excluded from further analysis include Lahontan Lake tui chub and Great Basin rams-horn. There is no suitable habitat for Lahontan Lake tui chub or Great Basin rams-horn in or within 0.5 mile of the Project areas and no known occurrences of the species in or within 0.5 mile of the Project areas. Likewise, Lahontan cutthroat trout are not known to occur in the action area and do not have suitable habitat within the action area and therefore, the project will not affect individuals or their habitat.

Sierra Nevada Yellow-legged Frog (*Rana sierrae*)

On 29 April 2014, the USFWS designated the Sierra Nevada yellow-legged frog (*Rana sierrae*) as an endangered species under the Endangered Species Act of 1973. This species is also a Forest Service Sensitive species. Sierra Nevada yellow-legged frog (*Rana sierrae*) inhabits ponds, lakes, and streams associated with montane riparian, lodgepole pine, subalpine conifer, and wet meadow communities (Zeiner et al. 1988, Jennings and Hayes 1994). Open stream and lake margins that gently slope to a depth of about 2 to 3 inches appear to be preferred (Jennings and Hayes 1994). In the Sierra Nevada, this species' elevational range extends from approximately 4,500 to 12,000 feet (Stebbins 1985, Jennings and Hayes 1994).

Suitable habitat for Sierra Nevada yellow-legged frog (SNYLF) has been identified in the Sky Meadows Basin and East Peak Lake. The proposed projects are not located in suitable habitat.

Surveys have been performed in the Sky Meadows Basin and East Peak Lake area by USFS personnel in 2013 (one survey on July 2), 2014 (two surveys: July 29 and Oct 8) and in 2016 (June 23). No Sierra Nevada yellow-legged frog were observed in either area or survey year. Sierran tree frog (*Pseudacris sierra*) adults and tadpoles were observed during each survey at East Peak Lake, while only Long-toed salamander (*Ambystoma macrodactylum*) was observed in the Sky Meadows Basin in the pond behind the California dam. Known existing occurrences (Hell Hole) of Sierra Nevada yellow-legged frog are

within 7.5 miles from the Project Area and are presumed extant. While suitable habitat exists adjacent to the projects, but not within the areas proposed for tree removal or ground disturbance (e.g., Sky Meadows basin and East Peak Lake) no Sierra Nevada yellow-legged frogs were noted during the completed protocol surveys. The proposed projects (ski trail widening and run hazard reduction) are not located directly in suitable habitat.

The 2016 LTBMU Forest Plan does not identify any aquatic resource species refuge areas within the project area.

3.6.2 Indicators for Analysis of Effects

The 2016 Forest Plan's desired conditions for biological resources seek "to guide future management in the preservation, enhancement, and, in some cases, restoration of biological resources." To achieve the desired conditions and objectives, the Forest Plan establishes a series of standards and guidelines. The following are applicable standards guidelines for fisheries and aquatic resources:

Conservation of Species and Habitat

SG43. On a project specific basis, prescribe measures needed to provide for the diversity of plant and animal communities and support the persistence of native species. [Guideline]

SG44. During project development, evaluate the project area, including any designated critical habitat, for the habitat suitability and/or occurrence of TEPCS species. [Standard]

SG45. Implement Limited Operating Periods (LOPs) for TEPCS species and TRPA identified native species when determined necessary through biological review. [Standard]

SG46. Maintain downstream flow and volume adequate to support aquatic species during in-stream restoration and/or water drafting activities. Avoid construction of artificial impoundments for water use except where needed for initial suppression of wildfires. Ensure that any artificial impoundments are removed after use and the area is restored. [Guideline]

SG48. Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by implementing corrective actions where BMPs have not been implemented or are not effective on roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow paths. [Guideline]

SG49. When stream crossings are constructed, reconstructed, or permanently removed, provide for aquatic organism passages. [Guideline]

SG50. Conduct fish salvage prior to in-stream management activities. [Guideline]

SG51. Employ measures such as limited operating period (LOP), buffering, and flagging and avoiding to minimize negative impacts to known TEPCS populations and habitats. [Guideline]

SG52. Genetically appropriate native plant materials shall be given primary consideration in revegetation, rehabilitation, and restoration. [Guideline]

SG53. When planting to increase willow cover, plant in patches with a mean size of 4,000 square feet. [Guideline]

SG54. Design pesticide applications to avoid adverse effects on TEPCS species and their habitats. [Guideline]

SG56. When facilities at developed recreation sites that are located in or adjacent to wetlands suitable for waterfowl nesting are opened between March 1 and June 30, implement appropriate actions (e.g., signing) to manage impacts from recreation (e.g., dogs) to maintain a low level of human disturbance on nesting waterfowl. [Guideline]

SG57. Manage stream reaches on the Forest to attain levels of stream shading which maintain cold water conditions from the months of June – September when precipitation and base flows are normally lowest and ambient air temperatures are highest. Cold water conditions during June – September should target a maximum 7-day mean temperature of 20oC or less. [Standard]

SG58. Provide a renewable supply of large downed logs that: (1) can reach the stream channel and (2) provide suitable habitat within and adjacent to the SEZs. Leave existing downed trees and CWD that are in perennial or intermittent stream channels in place unless removal is needed to maintain channel stability. [Guideline]

SG59. To avoid removing or altering bank stabilizing vegetation, trees may be marked for removal (live or dead) within 5 feet of the bank edge of perennial or intermittent streams and lakes, only where fuel loads or stand densities exceed desired conditions and where CWD is at or above desired levels or where trees are a hazard to safe operations. [Standard]

SG60. Use screening devices for water drafting pumps, except when emergency fire suppression activities make it impractical. Use pumps with low entry velocity to minimize removal of aquatic species, including juvenile fish, amphibian egg masses and tadpoles, form aquatic habitats. [Standard]

SG69. Prevent disturbance to streambanks and natural lake and pond shorelines caused by resource activities (for example, livestock, off-highway vehicles, and dispersed recreation) from exceeding 20 percent of stream reach or 20 percent of natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots. This standard does not apply to developed recreation sites; sites authorized under special use permits and designated off-highway vehicle routes. [Standard]

Invasive Species Management

SG73. Incorporate prevention and control measures into project planning, management activities and operations to prevent new introductions or contribute to spreading of invasive species, and reduce impacts from existing infestations on NFS lands, or to adjacent lands and water bodies. [Standard]

SG74. When feasible, employ the following control measures, such as: [Guideline]

a) Use contract and permit clauses to require that the activities of contractors and permittees (including but not limited to special use permits, utility permits, pack stock operators) are

conducted to prevent and control the introduction, establishment, and spread of aquatic and terrestrial invasive species.
b) Include invasive species prevention and control measures in mining plans of operation and reclamation plans.
c) When working in known invasive species infestations during project implementation, equipment and vehicles shall be cleaned before moving to other NFS lands.
d) Support partner agencies and their programs.
e) Use on-site materials where feasible, unless contaminated with invasive species.

SG75. Gravel, fill, topsoil, mulch, and other materials should be free of invasive species. [Guideline]

SG76. New infestations are inventoried and known infestations are prioritized and contained, controlled, or eradicated using an integrated management approach. [Standard]

Aquatic

SG78. All equipment and vehicles (Forest Service and contracted) used in a waterbody during project implementation shall be inspected and free of invasive species prior to implementation. [Guideline]

SG79. Take actions as needed to minimize the risk of spreading Bd fungus and other potential aquatic pathogens and/or diseases through aquatic systems. [Guideline]

SG80. Ensure that field gear (waders, float tubes, etc.) is cleaned, decontaminated, and/or fully dried prior to entering or moving between aquatic habitats. [Guideline]

SG82. Following emergency response guidelines, implement prevention measures to decrease the potential for aquatic invasive species transference [Guideline]

Special Status Species Habitat Areas

SG100. Management actions are consistent with habitat and population recovery objectives outlined conservation strategies and recovery plans. [Guideline]

SG101. In all Management Areas - in streams or lakes occupied by SNYLF, avoid disturbance within 10 feet of streambanks and lakeshores during breeding activities or where egg masses are present. [Standard]

SG102. In streams occupied by LCT, limit activity disturbance on or near stream banks and in floodplains until completion of spawning and egg incubation periods. [Standard]

3.6.3 Analysis of Direct/Indirect Effects

3.6.3.1 No Action - Alternative 1

If no action occurs (Alternative 1), no new direct or indirect impact to fisheries or aquatic resources would occur. Heavenly Mountain Resort would continue to operate under current conditions, including the ongoing implementation of mitigation measures as established in the 2007 MPA EIR/EIS/EIS and

2015 Epic Discovery Project EIR/EIS/EIS and contained in the 2015 Master Development Plan Mitigation Monitoring Plan.

3.6.3.2 Proposed Action - Alternative 2

Sierra Nevada Yellow-Legged Frog

The Proposed Action will not result in any impacts to suitable habitat for SNYLF as they are not located within any identified suitable habitat. There are no direct or indirect impacts to any individuals as protocol surveys have not resulted in the identification of any SNYLF being present within the project area. Indirect impacts to suitable habitat are not expected to occur due to the nature of the proposed projects (tree removal) and proposed BMPs that will decrease erosion potential from the snowmaking installation and run hazard reduction areas.

3.6.4 Cumulative Effects

Since Alternative 1 would result in no change in the current conditions and practices, it would not contribute to a cumulative effect.

The Proposed Action would not result in direct or indirect impacts to SNYLF and therefore would not contribute to a cumulative effect. Past projects underwent site-specific environmental analysis compared to the baseline biological conditions before approval. Future projects have been analyzed programmatically and will also undergo site-specific analysis before they can be approved or implemented, the potential effects of which will be compared against the baseline biological conditions.

The Management Emphasis of the Heavenly SUP area is alpine skiing, which is accompanied by modification to the biological environment. Project design features, BMPs, and avoidance of sensitive species will avoid or minimize impacts to habitat and sensitive species that may occur adjacent to the Project area. These practices have been, and will continue to be, applied to projects undergoing site-specific environmental analysis.

3.6.5 Analytical Conclusions

Since neither the No Action nor Proposed Action would result in effects to fisheries or aquatic resources, the Proposed Action is superior in that it would achieve the objectives of the project. In addition, reduced demand for and dependence on snowmaking along the affected runs reduces overall water consumption within the SUP and helps maintain healthy levels in East Peak Reservoir to support aquatic species in general.

3.7 Soils & Hydrology

The Proposed Action is contained within the boundaries of the existing Special Use Permit Area in accordance with the 2003 Forest Service's Lake Tahoe Basin Management Unit (Forest Service) special use permit approval. A small portion of the Proposed Action is located at the ridgetop of Heavenly Valley Creek watershed CA-1 and the Cold Creek watershed. Direct, indirect and cumulative effects to water

and soil quality are described for the following Heavenly Mountain Resort sub-watersheds that would be affected by the Proposed Action: CA-1 (Heavenly Valley Creek); NV-1 (Mott Canyon); NV-2+5 (Daggett Creek); NV-3 (Edgewood Creek); and NV-5 (Stagecoach). The current status of on-going mitigation measures and programs is summarized because compliance with such prior mitigation measures is necessary to avoid, minimize and reduce adverse effects to water and soil quality from past and current ski resort development, operations, and maintenance actions.

The following information and analyses tier from the 1996 MP EIR/EIS/EIS, 2007 MPA EIR/EIS/EIS, 2015 Epic Discovery Project EIR/EIS/EIS, 2015 Heavenly Mountain Resort Master Development Plan, 2016 Forest Plan and the 5-Year Cumulative Environmental Monitoring Report (Water Years 2012-2016). Each of these documents details the operations and management background and regulatory environment of Heavenly Mountain Resort and the environmental settings for each of the sub-watersheds. Figure 11 illustrates the locations of the project areas of the Proposed Action within watersheds CA-1, NV-1, NV-2+5 and NV-3.

3.7.1 Background

Chapters 3.1 and 3.2 of the 2015 Epic Discovery Project EIS/EIS/EIR detail the most current regulatory and environmental settings for water and soil resources within the Heavenly Mountain Resort SUP. Chapter 7 of the 2015 Heavenly Master Development Plan details the current mitigation and monitoring program (MMP). The original MMP was developed based on mitigation measures included in the Draft and Final EIS/EIS/EIS documents prepared for the MP 96. The MMP has been updated to reflect measures that have been completed, measures that are no longer applicable to planning, construction, operations and maintenance at Heavenly Mountain Resort, and the new measures required to avoid, reduce, minimize or otherwise mitigate adverse effects developed in the MPA 07 project and the 2015 Epic Discovery Project.

Compliance with the mitigation measures in Table 12 avoids, reduces, or minimizes potential adverse effects to water and soil quality from past, current and future project actions. Compliance is documented through Mitigation Measure Water-C1b, Environmental Monitoring Program, the results of which are reported annually in monitoring reports and cumulatively in 5-year comprehensive monitoring reports that are submitted to TRPA and Lahontan.

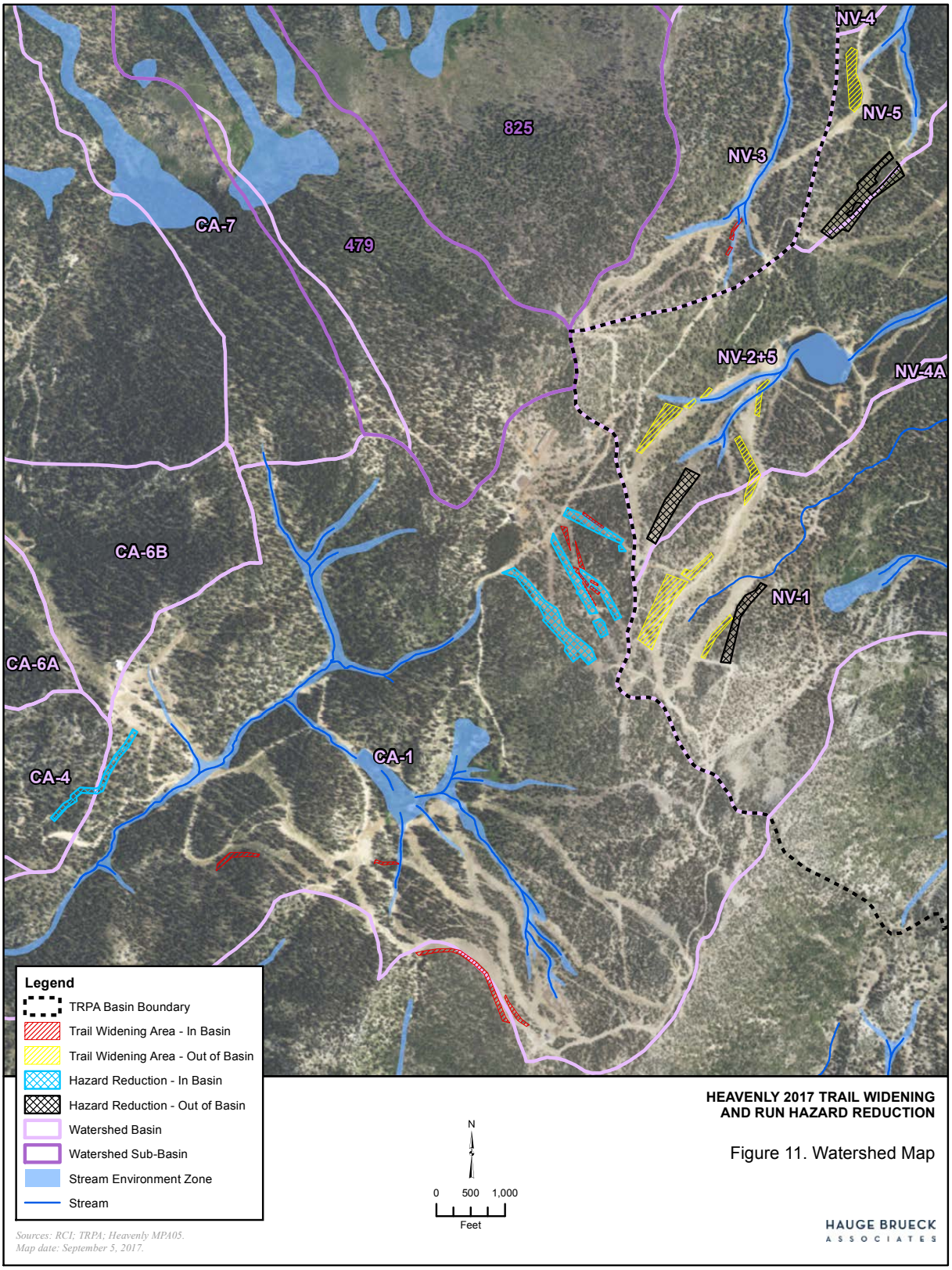


Figure 11. Watershed Map

Table 12. Compliance Status of Mitigation Measures Related to Water and Soil Resources		
Mitigation Measure	**Requirement**	**Compliance Status**
7.4-1 Construction Erosion Reduction Program	Ongoing	Yes
7.4-2 Construct Infiltration Facilities	Ongoing	Yes
WATER-1 Control Runoff for Existing Facilities	Completed	Yes
WATER-2 Meet Water Quality Standards	Ongoing	Partial Compliance • Violations of Total Nitrogen, Total Phosphorus and Chloride, annual average exceedances were reported at Sky Meadows (43HVC-1A), Below Patsy's Chair (43HVC-2) and Property Line (43HVC-3) sampling locations. • Violations of Total Phosphorus and Chloride, annual average exceedances were reported for the Hidden Valley Creek reference site (43HVDC-5) also. • Biotic Conditions for Heavenly Valley Creek stream reaches, specifically Sky Meadows Reach, are reported Impaired/Partially Altered (2016 BMI results) • In-stream fine sediment monitoring • Heavenly Valley Creek Total Maximum Daily Load (TMDL) rolling 5-year average, as of 2016, has not exceeded the state standard of 58 tons/year; Consideration of Water Year 2017 suspended sediment values is pending.
WATER-3: Implement Adaptive Ski Run Prescriptions	Ongoing	Yes
WATER-4: Control Runoff due to Future Construction and Long-term Operation of Facilities	Ongoing	Yes
7.5-1: Watershed Restoration Program (CWE)	Ongoing	Yes
WATER-C1a: CA-1 Erosion Reduction Measures	Ongoing	Implementing Compliance is required prior to new temporary or permanent disturbance in the Sky Meadows Basin of Heavenly Valley Creek (CA-1).

Table 12. Compliance Status of Mitigation Measures Related to Water and Soil Resources		
Mitigation Measure	**Requirement**	**Compliance Status**
WATER-C1b Ongoing Environmental Monitoring Program	Ongoing	Yes
WATER-C3 NV-1 Erosion Reduction Measures	Ongoing	Implementing Compliance is required prior to new temporary or permanent soil disturbance in Mott Creek Watershed (NV-1).

Source: 2015 Heavenly MMP Annual Resort, Amended Final (Cardno 2016); 5-Year Comprehensive Monitoring Report (Water Years 2012-2016) (Cardno 2017).

Physical resources considered in the 2016 Forest Plan include air quality, natural hazards, and physical components of watershed health, which include soil quality, surface and ground water quality, and geomorphic and hydrologic watershed processes. Forest Service land management primarily affects the water quality of Lake Tahoe through effects on other water bodies, especially the streams that drain into Lake Tahoe. Thus, the overall goal of achieving the Pathway desired condition for Lake Tahoe is directly correlated to achieving all the desired conditions. Desired conditions (DCs) are long term goals, expressed as a state of being. The desired conditions form the base of the Plan and help to shape the other Plan components. They express the sustainable ecological, social, and economic management goals towards which the LTBMU directs management activities.

Desired conditions for Water Quality include the achieving and maintaining the following:

DC9. Lake Tahoe's status as one of the few extremely nutrient-poor (ultraoligotrophic) lakes in the world with unique transparency, color, and clarity is preserved (adapted from Pathway).

DC10. Water quality conditions in the Lake Tahoe Basin protect human and environmental health. (Pathway)

DC11. Water quality provides for all designated beneficial uses of surface and ground waters and meets the goals of the Clean Water Act and Safe Drinking Water Act; surface waters are fishable and swimmable, and surface and ground waters are suitable for drinking after normal treatment.

Desired conditions for Soil Quality include achieving and maintaining the following:

DC4. Soils function commensurate with their land use to sustain native plant and animal life, regulate water flow, flooding and infiltration, cycle nutrients, and filter pathogens, excess nutrients and other pollutants. (Pathway)

DC5. Land coverage does not exceed the capability of the soil resources to offset the effects of impervious cover. The effects of impervious cover and disturbance are fully mitigated on a storm water zone basis. (Pathway)

DC6. Soils infiltrate, transmit and store water at rates and in quantities commensurate with the soil and ecosystem type.

DC7. Soil productivity sustains healthy populations of native and desired non-native plant communities that are appropriate for the soil type. Surface and subsurface soil organic matter are within the expected range for the soil and ecosystem type.

DC8. Accelerated (human-caused) soil erosion and resultant sediment and nutrient transport to surface waters do not impact soil productivity or water quality.

3.7.2 Indicators for Analysis of Effects

As identified in tiered documents, consideration is given towards potential impacts, which are a measurable physical change in the environment. An impact is considered an adverse effect under NEPA, if any of the following would occur:

1. Peak and total runoff increase, such that downstream conveyance or storage facilities (i.e., creeks, reservoirs, pipe channels, etc.) no longer have adequate capacity, or erosion in these natural and man-made systems, is created by increased runoff rates.

2. Elevations of flooding within existing delineated flood plain boundaries are increased.

3. The existing water quality of Heavenly Valley, Edgewood, Daggett or Mott Creeks is degraded.

4. The water quality thresholds for Heavenly Valley, Edgewood, Daggett or Mott Creeks are not maintained.

5. The state and regional regulatory Water Quality Standards/Objectives are not satisfied.

6. The watershed percent Equivalent Roaded Areas (ERAs) are above their respective Threshold of Concerns (TOCs).

7. The TRPA 208 Plan policies or Code of Ordinance Standards are not satisfied.

8. Non-compliance with Board Order No. R6T-2015-0021, WDID 6A0900033000, Updated Waste Discharge Requirements and the associated Monitoring and Reporting Program and hence the Lahontan Basin Plan.

9. Non-compliance with El Dorado and Alpine General Plans.

Additionally, the Proposed Action is assessed for consistency with the 2016 Forest Plan standards and guidelines for water quality, which include the following:

SG4. Design all Forest management activities to prevent violations of applicable water quality standards. [Guideline]

SG5. Apply current version of the PSW Region Best Management Practices as described in Forest Service Handbook direction for Soil and Water Conservation, Water Quality Management, and Forest Service National Core BMP Technical Guide to all management activities. [Standard]

SG6. For waters designated as “Water Quality Limited” (Clean Water Act Section 303(d)), participate in the development of Total Maximum Daily Loads (TMDLs) and TMDL Implementation Plans. Execute applicable elements of completed TMDL Implementation Plans. [Standard]

SG7. Store fuel and other toxic materials only at designated sites. Prohibit storage of fuel and other toxic materials within SEZs except at designated administrative sites and sites covered by a Special Use Authorization. Refuel outside of SEZs unless there are no other alternatives. [Guideline]

The Proposed Action is assessed for consistency with the 2016 Forest Plan standards and guidelines for soil quality, which include the following:

SG10. Avoid soil displacement to the extent practical when grading slopes, piling brush or slash, or engaging in other heavy equipment operations where earth moving is not the objective. [Guideline]

SG11. During vegetation management activities, limit operation of wheeled or tracked vehicles and timber harvesting equipment to designated routes, and restrict operations to periods of suitable soil moisture conditions as defined in project planning documents and contracts. Suitable conditions also include frozen ground, and/or a firm, protective base of compacted snow. When suitable conditions are not present, restrict equipment use to roads and designated stream crossings unless suitable mitigation measures can be employed. [Guideline]

SG12. Avoid unstable areas and SEZs when reconstructing existing roads and landings or constructing new roads and landings. Minimize and mitigate impacts where avoidance is not practical. [Guideline]

SG13. For vegetation management activities, detrimental disturbance that results in permanent soil impairment (defined in FSM 2550.5) should generally be limited to 15% of the activity area, or unit. The permanent transportation system is excluded from this calculation. [Guideline]

3.7.3 Analysis of Direct/Indirect Effects

3.7.3.1 No Action - Alternative 1

The No Action Alternative would continue to implement projects analyzed in the 2007 MPA and the 2015 Epic Discovery Project, both approved amendments to the 1996 Master Plan. The No Action Alternative is detailed in the 2015 Master Development Plan. Mitigation measures and design features to maintain ERAs below watershed TOCs, control peak and total runoff, install and maintain permanent BMPs, and comply with TRPA Environmental Thresholds and TRPA, Lahontan and NDEP water quality standards and objectives will continue to be implemented under the No Action Alternative.

3.7.3.2 Proposed Action - Alternative 2

The Proposed Action would implement 6.5 acres of trail widening prescriptions in watershed CA-1 and 18.8 acres in watersheds NV-2+5 and NV-3; 18.6 acres of run hazard reduction prescriptions in watershed CA-1 and 16.3 acres in watersheds NV-1, NV-2+5, and NV-5; and relocate or extend 5,800 linear feet of snowmaking pipelines. Temporary soil disturbance from grading and trenching for the underground snowmaking pipeline relocation or extension is estimated at 17,400 square feet. Staging and access areas will be located on previously developed areas; temporary soil disturbance will occur during the 2018 construction period.

The Proposed Action proposes no permanent soil disturbance or TRPA land coverage. No unique geologic or physical features have been identified within the SUP that could be destroyed, covered or modified. The Proposed Action will not significantly alter topography or ground surface relief features. Project components would not be located within areas of known faults or in areas where soil substrate consists of material that is subject to liquefaction or other secondary seismic hazard in the event of

ground shaking. The areas of the SUP that will be affected by the Proposed Action exhibit no evidence of static hazards such as landslides. The steep slopes found in much of the SUP result in moderate to severe erosion hazard ratings; implementation of the design features of the Proposed Action along with continued maintenance and revegetation of disturbed areas will be critical to limiting erosion.

Trail Widening

The Proposed Action avoids direct effects to water and soil quality by conducting tree removal during winter months, over a 12-inch or more of compacted snow depth, and outside of Waterbody Buffer Zones (WBZs), as defined in the 2014 Timber Waiver. WBZs are similar to the Forest Service concept of a "Streamside Management Zone" (SMZ), which is a zone adjacent to waterbodies designated for special management controls aimed at protection and improvement of water quality. Unlike WLPZs, universal widths for SMZs are not specified, but developed on a project-specific basis taking into account factors such as stream class, channel aspect and stability, sideslope steepness, and slope stability. For trail widening in watershed CA-1, the Waterbody Buffer Zones are applicable to prescriptions. For trail widening in watersheds NV-1, NV-2+5 and NV-3, the SMZs are applied applicable to prescriptions.

Select boulder relocation and minor grading to match final trail grades will directly impact effective soil cover and topsoil.

Trail widening activities can create indirect effects to soil and water quality through:

- Removal of tree canopy and vegetative ground cover;
- Temporary soil disturbance associated with boulder relocation and grading;
- Creation of new sources of erosion;
- Changes in localized rate of evapotranspiration; and
- Alteration of rate and volume of infiltration and surface runoff.

Indirect effects are reduced and minimized through revegetation and the surface application of mulch that will be locally sourced by limbing and chipping the smaller diameter trees that are to be removed over the snow and then stored at the nearest staging area. Trail widening prescriptions also include the retention of low-lying vegetation to the greatest extent practicable and also the strategic placement of larger rocks and boulders, which are removed from trail widening areas, in areas of potential slope instability and to reinforce existing waterbar outlets. Where present in usable quantities, existing topsoil or organic material will be removed and stockpiled for later use in stabilization and revegetation of areas disturbed or compacted by heavy equipment. Cleared forested areas created by trail widening actions are required to achieve 70% effective soil cover in order to minimize potential adverse effects to water and soil quality.

Run Hazard Reductions

Run hazard reduction involves temporary disturbances and thus direct effects to effective ground cover and soils. Direct effects to water and soil quality will be reduced and minimize through project location and design features. The proposed hazard reduction areas are sited outside of defined Waterbody Buffer Zones or SMZs, and Easy Street Run Hazard prescriptions, by design and as supported by WEPP modeling results, minimize soil disturbance and removal of surface vegetation. For trail widening in watershed CA-1, the Waterbody Buffer Zones are applicable to prescriptions. For trail widening in watersheds NV-1, NV-2+5 and NV-3, the SMZs are applied applicable to prescriptions.

To minimize indirect effects, which would be similar to those for trail widening, run hazard prescriptions include slope stabilization measures, moving existing large diameter logs from the ski run to the adjacent forested area of the designated ski run to mimic natural surroundings and in steeper terrain place logs perpendicular to the slope to reduce soil erosion hazards. Logs less than 18-inch diameter will be retained and aligned across the slope and in contact with the ground surface. Stumps are retained but cut to a height of six (6) inches or less from the ground surface. Rock fragments from capped boulders will be placed as to maximize contact with ground surface. The required resultant effective soil cover is 70%.

Snowmaking Pipeline Relocation

Relocation or extension of existing snowmaking pipelines will require temporary soil disturbance for trenching and excavation.

The need to relocate or extend snowmaking pipelines to the new edge of widened ski trails is required to place the snowmaking guns on the edge of the widened trail. However, the potential effects of construction of new underground snowmaking systems have not been quantitatively been analyzed in prior environmental clearance documents or cumulative effects analyses because all new snowmaking systems were intended to be installed above ground. The project relocates and extends existing snowmaking systems on the applicable trails.

Construction of underground snowmaking pipelines will involve soil disturbance and vegetation clearing from clearing and grubbing, trenching, excavating, stockpiling soils, filling, and compacting. Construction activities could result in temporary, short-term increases in runoff, soil erosion, wind erosion, and sedimentation within and down gradient of the construction area. The potential for soil erosion is greatest during the construction period when slopes are disturbed and prior to reestablishment of vegetation. Wind can dislodge soil particle and make them airborne when disturbed sites are not adequately stabilized and revegetated.

TRPA Code Chapters 30, 33, 60, the 208 Plan, the Lahontan Basin Plan (Chapter 5), and the Forest Service Soil and Water Handbook, along with construction permit conditions detail the requirements for the control of erosion on and off-site and the stabilization of soil conditions during and upon completion of ground disturbing actions. These erosion control requirements are addressed in the mitigation measures included in the 2015 Master Development Plan Mitigation Monitoring Plan.

Construction Staging and Access Areas

Staging and access areas, as described in the Project Description and identified on Improvement Plans, are located in areas of previous disturbance and outside of the boundaries of Waterbody Buffer Zones and SMZs, as applicable. No vegetation removal or permanent soil disturbance will occur in these areas. Temporary disturbance will be contained by site-specific construction BMPs and sites will be revegetated, as necessary, to return staging and access areas to existing conditions. Fuel and other materials will be stored only at these designated areas.

3.7.4 Cumulative Effects

The management practices and standards and guidelines of the 2016 Forest Plan apply to all watersheds of Heavenly Mountain Resort. Additionally, Federal NEPA requires a cumulative effects analysis. The Cumulative Watershed Effects analysis was developed by the Forest Service as a tool to complete cumulative effects analysis. The procedure for evaluating the cumulative effects of master development at Heavenly Mountain Resort is based on criteria set forth in the Soil and Water Conservation Handbook

(Forest Service Handbook 2509.22). Chapter 20 of this handbook offers a complete description of the authority, objectives and policies of the Forest Service's Cumulative Off-site Watershed Effects (CWE) Analysis.

The MP 96 Steering Committee worked with the Forest Service to develop a CWE Model for specific use at Heavenly Mountain Resort to assess compliance with direction to mitigate past direct and indirect effects and future potential cumulative effects to soil and water quality of the resort's watersheds. The CWE Model results were used to compile and prioritize the CWE Restoration Program for mitigation of potential adverse effects from ski area development, operations and maintenance. A Watershed ERA (Equivalent Roaded Area) above the Allowable TOC (Threshold of Concern) is considered a potential adverse effect.

The CWE assessment was updated for the MPA 07 EIS/EIS/EIR but did not contemplate cumulative watershed effects of the Epic Discovery Project. As such, the CWE analysis conducted for the Epic Discovery Project EIS/EIS/EIR in 2015 estimated watershed ERAs of the MPA 07 at full build out with the additional components proposed in the Epic Discovery Project. Table 13 reports the Existing, Proposed and Cumulative %ERA by Watershed, as updated to include effects of the Epic Discovery Project, along with the most recently reported channel conditions (i.e., 2015 and 2016 reporting) for Heavenly Valley Creek (CA-1), Mott Creek (NV-1), Daggett Creek (NV-2+5) and Edgewood Creek (NV-3).

TABLE 13. Cumulative Watershed Effects Summary

Watershed	Threshold of Concern (TOC)[1]	Existing %ERA[2]	Proposed %ERA at Build Out[3]	Channel Conditions[4,5]
CA-1	5%	4.29	4.59	Physical - Stable Chemical – Good, Periodic exceedances of water quality constituents; Conditions approaching or exceeding Hidden Valley Creek; Continued compliance with TMDL 5-year rolling average Biological – Impaired; Likely Altered
NV-1	4%	3.81	4.24	Physical - Stable Chemical – N/A Biological – N/A
NV-2+5	7%	4.32	5.70	Physical - Good Chemical – N/A Biological – N/A
NV-3	5%	5.52	5.61	Physical - Good Chemical - Good Biological – N/A

Notes: [1] Thresholds of Concern (TOCs) were developed as part of the 96 Master Plan EIS/EIS/EIR

[2] Existing %ERA equates the CWE model output for 2013 Existing Conditions ERA plus the Epic Discovery Project ERA; since most of the Epic Discovery Project components have been implemented or are currently in process, this ERA best communicates 2017 Existing Condition

[3] Proposed %ERA equates the CWE model output estimate for Buildout of the 2007 Master Plan Amendment with the additional components of the Epic Discovery Project; %ERA at Buildout includes assumptions for run widening, but new and relocated snowmaking lines were not considered

[4] Channel conditions are as reported in the 5-year Environmental Monitoring Report (Water Years 2012-2016) and updated to reflect 2016 BMI results.

[5] The latest WDR list the watershed and TMDL Target Evaluation Criteria (found in Appendix C of the WDR)."The Water Quality Rating Criteria are as follows: -Excellent. All water quality parameters meet State and Tahoe Basin standards; water quality concentrations for all parameters are decreasing -Good. Most water quality parameters meet State and Tahoe Basin standards; water quality concentrations for most parameters are decreasing compared to baseline data, while others are stable. -Fair. Some water quality parameters meet State and Tahoe Basin standards; water quality concentrations for some parameters are decreasing compared to baseline, while others are stable -Poor. No water quality parameters meet State and Tahoe Basin standards; water quality concentrations are increasing for some parameters"

Watershed CA-1 (Heavenly Valley Creek)

The numeric targets developed for the Heavenly Valley Creek sediment TMDL are intended to interpret the narrative and numeric water quality objectives, which in turn provide for support of designated beneficial uses. The following paragraphs define the desired conditions for Heavenly Valley Creek and current reporting status:

Suspended sediment concentrations/Total In stream sediment load: The numeric target is an annual mean suspended sediment concentration at the "Property Line" station, expressed as a 5-year rolling average, no greater than that observed in the reference stream, Hidden Valley Creek. The numerical target for total in stream sediment loading in Heavenly Valley Creek is 58 tons/year, expressed as a five year rolling average as measured at the Property Line monitoring station. This number reflects the modeled maximum feasible reduction in sediment leading with full application of BMPs to the watershed. It is believed to be close to natural conditions and reasonably comparable with the estimated 45-tons/year total sediment load in Hidden Valley Creek. Water years 2012 through 2016 rolling 5-year average values are all below the standard of 58 tons/year. Since 2005, the total maximum daily load rolling 5-year average has not exceeded the state standard. (Cardno 2017)

Stream condition index and stability: Over time, Heavenly Valley Creek should show a trend of increasing stability in channel morphology. Physical channel conditions are reported as Stable in the 5-year Cumulative Environmental Monitoring Report.

Streambank stability is a measure of the vulnerability of streambanks to erosion. Stable banks show no indicator of instability (e.g., erosion). Vulnerable banks have 75% or more cover, but have one or more instability indicators. Unstable banks have less than 75% cover and have instability indicators. Unstable streambanks are often bare, or nearly bare, composed of particle sizes too small or non-cohesive to resist erosion at high flows. As reported in the 5-Year CMR, The percent of stable banks along Heavenly Valley Creek varied over time at each of the three reaches (Figure 5-19). Stability increased from 2006 to 2009, substantially at Sky Meadows and Below Patsy's, and modestly at Property Line; however results from 2011 and 2015 show decreases in streambank stability. Property Line experienced an increase in stability in 2015, from 4% in 2011 to 29% in 2015. Below Patsy's and Sky Meadows however experienced a slight decrease in stability.

The Sky Meadows reach exhibits the most stable streambank measurements over the 10-year period with the average percentage of stability at 76%. The Below Patsy's site average over the ten-year

monitoring period is 67% stable banks, while the Property Line monitoring reach average over the same time frame is around 35% stable banks. The reason for the dramatic drop in stability at the Property Line location in 2011 is uncertain; but the same observers rated all sites in 2011, so it is not likely due to qualitative rating differences. It is possible that differences in LWD and/or rock material along the banks and/or aggradation changes occurred due to higher flows in 2011. Drought conditions from 2012-2015 likely account for the decrease stability and vegetation cover at both Sky Meadows and Below Patsy's; however, the opposite trend occurs at Property Line as the percentage of stability increases from 2011 to 2015.

Macroinvertebrate community health: Over time, there should be improving trends in benthic macroinvertebrate community metrics, approaching conditions in Hidden Valley Creek. Biotic conditions that are reported through 2016, as measured by bioassessment scoring using Eastern Sierra IBI and the California Stream Condition Index (CSCI), indicate that the Sky Meadows reach of Heavenly Valley Creek is "Impaired" and "Likely Altered." However, 2015 and 2016 bioassessment scores for Upper Hidden Valley Creek reach, the reference condition reach, report an "Impaired" and "Likely Altered" condition.

Watershed disturbance: Schedules in ski resort master plan mitigation program for implementing and maintaining BMPs for roads and ski runs are met, with progress and BMP effectiveness reported annually and evaluated at 5-year intervals. Each year Heavenly had prioritized CWE projects based on maintenance needs, costs, funds, proximity to water bodies and erosion potential as well as construction implementation. Moving forward, future projects are prioritized based on the Watershed Maintenance and Restoration Program (Epic Discovery Draft EIR/EIS/EIS Appendix 3.1-D). These projects have been "organized in phases based on Priority ski trails and road segments treatment needs as well as tied to capital project implementation phasing". During the 2015 monitoring season, RCI was responsible for BMP implementation and effectiveness monitoring. Results from the 2015 monitoring effort are located in Appendix I. Based on revisions to this measure, RCI will continue to monitoring and inspect BMPs shifting from the CWE tools and instead focus on compliance with the WDRs. Appendix III of the 2015 TRPA MMP Report contains the updated status list of Watershed Maintenance and Restoration Program projects for the 2015 construction season. Appendix VII contains the list of Watershed Maintenance and Restoration Program projects implemented in 2016. Continued implementation of restoration and maintenance of areas identified as areas of chronic erosion and/or high hydrologic connectivity to water bodies minimizes the cumulative effects of past ski area development and operations.

The CWE analysis for the Epic Discovery Project for watershed CA-1 concluded that as %ERA would approach the watershed TOC and additional development would occur in the headwaters of Heavenly Valley Creek such that additional mitigation measures were needed to reduce the potential for increase in magnitude, duration or frequency of the existing adverse biotic condition in the Sky Meadows reach. Mitigation Measure WATER-C1a: CA-1 Erosion Reduction Measures required that High and Moderate risk sources of erosion or "hotspots" be addressed prior to of concurrent with new permanent or temporary soil disturbance. This mitigation measure is currently being implemented with compliance expected in 2017.

Effective soil cover (vegetation, woody debris, organic matter, rocks) on ski runs and roads: Cover meets modeled mitigation targets set for specific road/run segments in watershed, and overall cover rating is "Good" or better using LTBMU evaluation criteria. Heavenly's BMP effectiveness rating criteria is "Excellent". Over the past 5-years Heavenly has 100% implementation of both permanent and

temporary BMPs. In addition the effectiveness of both permanent and temporary BMPs scored greater than 90% over the past 5-year period, as reported in the 5-Year Comprehensive Monitoring Report.

Watershed NV-1

Desired conditions for NV-1 include: a watershed %ERA that remains below the watershed TOC and the maintenance of stable channel conditions. The CWE analysis for the Epic Discovery Project for watershed NV-1 concluded that as %ERA would exceed the watershed TOC and additional development would occur in the headwaters of Mott Creek such that additional mitigation measures were needed to reduce the potential for increase in magnitude, duration or frequency of the existing adverse biotic condition in the Sky Meadows reach. Mitigation Measure WATER-C3: NV-1 Erosion Reduction Measures required that High and Moderate risk sources of erosion or "hotspots" be addressed prior to of concurrent with new permanent or temporary soil disturbance. This mitigation measure is currently being implemented with compliance expected in 2017.

The Mott Creek site (MC-1) exhibits characteristics of a Rosgen "Aa+" type channel. It is very steep (>10 percent), well entrenched, and is highly confined. Typical characteristics include step/pool morphology with chutes and waterfalls (Rosgen 1996). As discussed above in Section 5.3 in the 5-Year CMR, LTBMU staff does not feel the establishment of an in-channel monitoring of this reach is necessary in Mott Creek Watershed due to the boulder dominate stability of the channel. The channel type has not changed since 2006.

Watershed NV-2+5

Desired conditions for NV-2+5 include: a watershed %ERA that remains below the watershed TOC and the maintenance of stable channel conditions. The %ERA for Daggett Creek watershed is below the watershed TOC. The Upper Daggett Creek site (DC-1) exhibits characteristics of a Rosgen "Aa+" type channel. An "Aa+" type channel is a very steep, deeply entrenched stream with the capacity of debris transport (Rosgen 1996). This reach is steep (>10 percent), well entrenched, and is highly confined. Typical characteristics include a step/pool morphology with chutes and waterfalls (Rosgen 1996). The channel type has not changed since 2006. The Lower Daggett site (DC-2) exhibits characteristics of a Rosgen "A" type channel. It is similar to an "Aa+" type channel in terms of several channel characteristics, yet has lower channel slope (Rosgen 1996). The channel type has not changed since 2006. The percent of stable banks along Upper Daggett Creek (Figure 5-22) displayed the same pattern of increased stability between 2006 and 2009, and decrease in stability in 2015. However, the bank stability decline along the Daggett Creek reaches has not declined below the 2006 stability measurements. Stability has remained fairly stable across years at the Lower Daggett Creek monitoring reach.

Watershed NV-3

Desired conditions for NV-3 include: a watershed %ERA that remains below the watershed TOC and the maintenance of stable channel conditions. Edgewood Creek watershed was modeled to have a %ERA above the watershed TOC for the Epic Discovery Project CWE analysis update. The Edgewood Creek watershed has been the location of multiple restoration projects. The restoration project in the portion of Edgewood Creek including the Upper Edgewood riparian monitoring site (EC-1) is referred to as the North Bowl Restoration Stream Environment Project. Phase 1 (the downstream two-thirds of the project) of the North Bowl Restoration Stream Environment Project was completed in 2006. Edgewood Creek below Boulder Parking Lot (EC-2) also underwent restoration in 2007. These restoration activities

included repair of a head-cut and channel incision by constructing plunge pools and riparian planting. The restoration of Lower Edgewood Creek occurred directly upstream of EC-2, incorporating the upstream cross-section of the riparian monitoring site. A vault treatment system was installed in the Boulder parking lot in 2005. As reported in the 5-Year CMR, the channel type has not changed since the 2006

3.7.5 Analytical Conclusions

Direct and Indirect Effects

This analysis concludes that the Proposed Action proposals include resource protection measures and design features that are appropriate and adequate to control erosion on and off-site and stabilize soils during and upon completion of construction and soil disturbance activities. Project-level effects would not result in direct or indirect adverse effects to surface runoff or soil erosion and water or soil quality.

The Proposed Action avoids, reduces, minimizes or otherwise mitigates potentially adverse direct and indirect effects to water quality and soil quality through project location, application of permanent BMPs and design features illustrated in the RCI Improvement Plan set and outlined in the 2015 MDP MMP, such as the ongoing Construction Erosion Reduction Program (CERP), and continued implementation of the CWE Restoration Program, Adaptive Ski Trail Prescriptions and Environmental Monitoring Program.

Project proposals on National Forest Lands include design features and project-specific resource protection measures that are appropriate and adequate to control surface runoff and soil erosion on and off-site and stabilize soils during and upon completion of construction and soil disturbance activities. Trail widening, run hazard reduction and snowmaking pipeline relocation or extension would not adversely affect surface runoff or create new areas of chronic soil erosion because actions would be conducted in accordance with law, regulation, policy, Forest Plan standards and guidelines, and project-specific resource protection measures.

The Proposed Action is consistent with Forest Plan Standards and guidelines SG5, SG6, SG7, SG10, SG11, SG12 and SG13. The Proposed Action avoids the creation of new sources of chronic erosion through implementation of project design features and permanent BMPs. The annual monitoring reports show that BMPs are effective at controlling erosion from past disturbance on the mountain. The effectiveness of BMPs in preventing/mitigating sediment transport will continue to be monitored through the ongoing Environmental Monitoring Program. The Forest Service BMPEP evaluation will continue to inform to what degree these BMPs are implemented and effective in protecting soil and water quality.

The Proposed Action will not increase impervious land coverage nor would actions remove tree canopy and vegetative groundcover to the extent that increases in peak and total runoff volume would result in watersheds CA-1, NV-1, NV-2+5 or NV-3, when combined with past, current, and future projects. Hydrologic connectivity of the Proposed Action to water bodies is low.

As the landowner, the Forest Service is a co-discharger with Heavenly Mountain Resort. Compliance with Waste Discharge Permit (Lahontan), environmental thresholds and surface water quality standards of TRPA, and NDEP narrative water quality objectives is required. Compliance with the requirements of Lahontan Board Order R6T-2015-0021 and the TRPA Mitigation and Monitoring Program will continue. As reported in the 5-Year Comprehensive Monitoring Report (CMR), holistically looking at the water quality data over the past 5 years at each of the monitoring site locations, water quality has remained

the same or improved over the previous 5-year period. Changes in the updated Lahontan Waste Discharge Requirements required water quality sampling at the Sky Meadows sampling location (43HVC-1a) at a frequency in alignment with the other stations along Heavenly Valley Creek. Water year 2016 marked the first full year of water quality sampling at Sky Meadows (43HVC-1a) since the 2006 water year. Until bioassessment and water quality results show improvement at Sky Meadows (43HVC-1a), water quality monitoring and benthic macroinvertebrate (BMI) collection will continue at this site. Annual monitoring reports will continue to make recommendations for improvements.

Construction and operation of the Proposed Action would not directly contribute to current non-compliance with surface water quality standards and thresholds because the Proposed Action provides for adequate WBZ and SMZs. The watersheds that comprise the Proposed Action are not determined to be at risk for exceedence of water quality standards, as reported in annual and cumulative monitoring reports. Compliance has been maintained with the Heavenly Valley Creek TMDL 5-year rolling average.

Cumulative Effects

Heavenly Mountain Resort will continue to implement and comply with the Watershed Restoration Program (Mitigation Measure 7.5-1) and Erosion Reduction Measures in watersheds CA-1 and NV-1 (Mitigation Measures WATER-C1a and WATER-C3, respectively), which detail areas for restoration actions to address areas of chronic erosion and hydrologic connectivity with water bodies. Implementation and effectiveness will continue to be monitored and reported annually through the ongoing Environmental Monitoring Program. The mitigations have the purpose of continuing to address cumulative effects of prior ski resort development and minimize the potential for past effects to combine with current and future project actions.

Planning and permitting for other reasonable and foreseeable projects will require similar plan sets and BMP effectiveness standards. The possibility for BMP failure exists on any project area, especially when extreme runoff conditions exceed BMP design capacities. The likelihood of the effects of BMPs failures in one project area combining with those of another project is low because BMP failures are typically localized and would be identified and corrected during ongoing monitoring of the project area. Therefore the Proposed Action will not make significant contributions towards adverse cumulative effects to water and soil quality from changes in surface runoff, accelerated erosion or unstable slopes.

3.8 Heritage Resources

3.8.1 Background

The National Historic Preservation Act (NHPA) requires that Federal agencies take into account the effects that their undertakings could have on properties listed on or eligible to the National Register of Historic Places (NRHP). This effects assessment is accomplished through inventory, evaluation, and determination of effects in under the terms of the Section 106 process, the public, and pertinent Native American Tribes.

The affected environment for cultural resources is detailed in Section 4.11 of the 1996 Heavenly Ski Resort Master Plan EIR/EIS/EIS and Section 3.11 of the 2007 Master Plan Amendment EIR/EIS/EIS. A summary of the affected environment for cultural resources is provided below.

During Phases I and II of the cultural resources work, approximately 3,145 acres were field-surveyed which was comprised primarily of ground of less than 35 percent slope, Topography of greater than 35 percent slope presented hazardous field conditions and was usually not physically surveyed unless cultural resources were expected based on the location of known resources. A total of 22 prehistoric and historical sites were recorded during the field survey. The Phase I and Phase II results were combined into a single report (S&S Archaeological Consultants, 1994). No prehistoric or historic sites were recorded in California during the Phase I and Phase II surveys.

A Programmatic Agreement (PA) among the Forest Service, LTBMU, the Advisory Council on Historic Preservation, the State Historic Preservation Officer - Nevada, and the Heavenly Ski Resort regarding the Heavenly Ski Resort Master Plan has been prepared to protect the properties eligible for inclusion in the National Register of Historic Places that are within the Heavenly Ski Resort permit boundary. All Master Plan projects that may potentially affect these properties must be administered in accordance with the stipulations in the PA.

3.8.2 Indicators for Analysis of Effects

The Proposed Action is assessed for consistency with the 2016 Forest Plan standards and guidelines for heritage resources, which include the following:

SG118. When avoidance of adverse impacts is not possible, authorize impacts to significant properties only after negotiating and signing a Memorandum of Agreement between the Forest Service and/or the appropriate State Historic Preservation Officer and Advisory Council on Historic Preservation. [Guideline]

SG119. Collect cultural artifacts only for diagnostic dating purposes, answering research questions, or protection of the artifact. [Guideline]

SG120. Except as noted in the foregoing guideline, record cultural artifacts in detail in the field, and leave them in place. [Guideline]

SG121. Include historic property protection provisions in contracts and special use permits as applicable. [Guideline]

SG122. Prohibit the use of metal detectors to locate archaeological or historical artifacts except for scientific research as permitted by the Forest Service. [Guideline]

SG123. Consult with the Washoe Tribe of Nevada and California when management activities may affect tribal rights and interests or impact culturally important resources, consistent with the Consultation Protocol. [Guideline]

3.8.3 Analysis of Direct/Indirect Effects

3.8.3.1 No Action - Alternative 1

This alternative would have no direct or indirect effects on existing cultural resources as no change or action would occur.

3.8.3.2 Proposed Action - Alternative 2

As documented in the September 1, 2017 Heritage Resources determination letter, no potentially eligible resources are known to be located within the boundaries of the proposed action. As such, the project would not result in direct or indirect effect to historic properties.

3.8.4 Cumulative Effects

The project would not result in direct or indirect effects to historic properties, therefore there would be no cumulative effects.

3.8.5 Analytical Conclusions

The project would not result in direct, indirect, or cumulative effects to historic properties and would result in a “no effect” determination to heritage resources.

Chapter 4 – Coordination and Consultation

The following individuals, agencies, and organizations were consulted during the preparation of this document.

4.1 LTBMU Interdisciplinary Team Members

Ashley Sibr, Landscape Architect, Project Team Lead

Stephanie Coppeto, Wildlife Biologist

Matt Dickinson, NEPA Advisor

Gina Thompson, Recreation Staff Officer

John Maher, Tribal Relations and Heritage

Quinn Young, Botanist

Jonathan Cook-Fisher, Recreation Special Uses Program Manager

Josh Sjostrom, Acting Special Projects Manager for Special Uses

4.2 Federal, State, and Local Agencies

Tahoe Regional Planning Agency

Lahontan Regional Water Quality Control Board

Nevada Division of Natural Resources

4.3 Tribal Coordination

Washoe Tribe of Nevada and California

4.4 Individuals

The following list represents individuals who responded during the NEPA scoping period:

Bob Rowan

Peter O'Hara

Stan Moore

Clay Grubb

Ralph and Terri Thomas

4.5 Organizations

The following list represents organizations that were contacted about this project and/or provided input during the NEPA scoping period:

None

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Appendix A

Soil and Water Protection BMPS for Heavenly 2017 Projects

NEPA analysis provides a conceptual description of the BMPS to be applied during project implementation. The conceptual description of BMPs is provided through the US Forest Service National Core BMP Technical Guide and Region 5 Water Quality Management Handbook. The links to these two documents are provided below.

http://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5399662.pdf

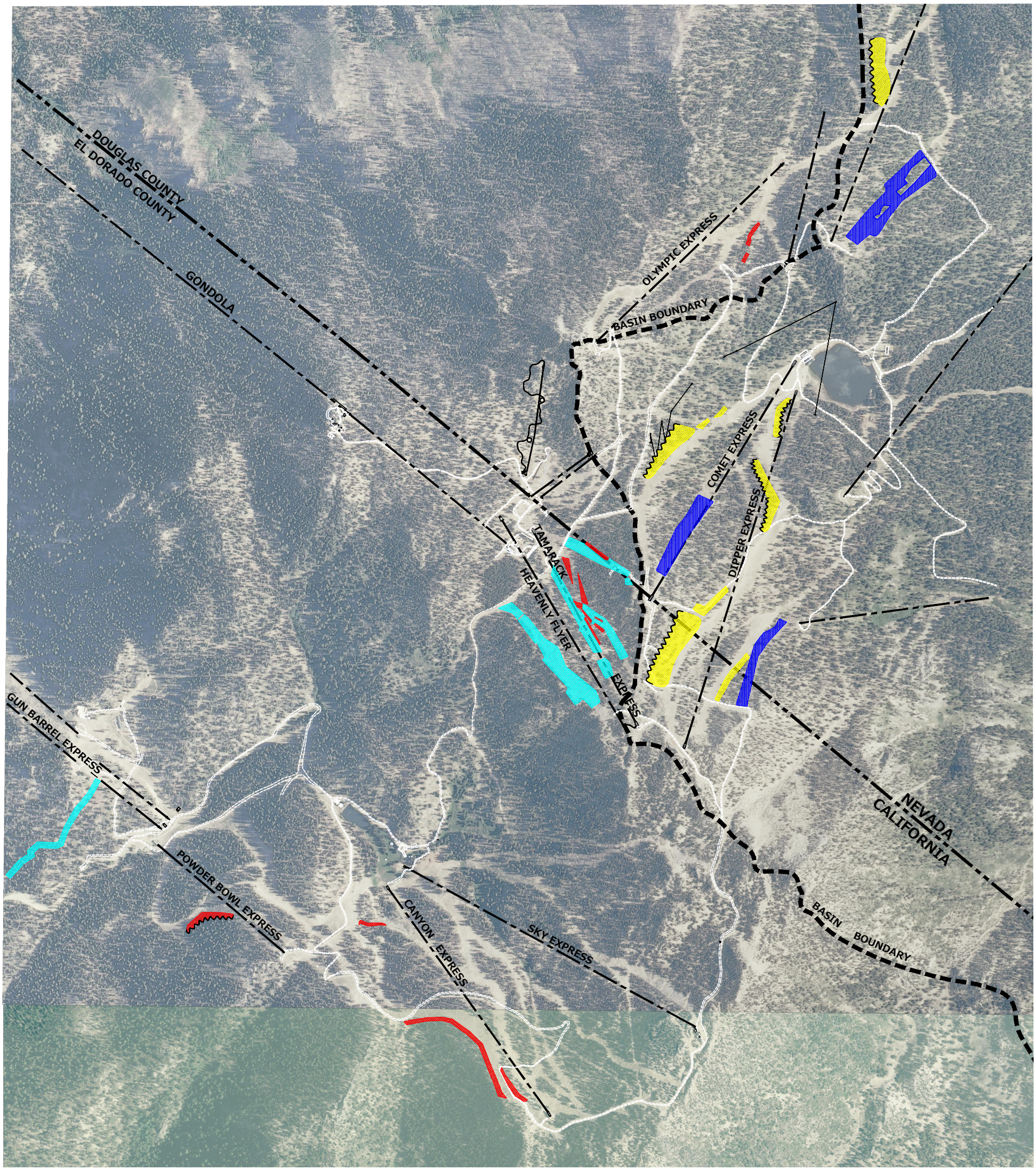
The table below displays the USFS BMP guidance to be utilized during project planning, design, and implementation. The most protective BMP between the National and Regional BMP guidance documents has been identified. In some cases, additional project specific direction has also been provided.

This guidance provides the language, or guidance for developing the project specific language/maps, to be incorporated into project contracts and implementation plans prior to project implementation.

National or Regional BMP Identifier	**Title/*Objective***	**Additional LTBMU guidance**

Appendix B

2017 Capital Improvements Project Plan Set



LEGEND:

- BASIN BOUNDARY
- EXISTING SKI LIFT
- RUN WIDENING - IN BASIN
- RUN WIDENING - OUT OF BASIN
- RUN HAZARD REDUCTION - IN BASIN
- RUN HAZARD REDUCTION - OUT OF BASIN
- EDGE OF NEW WIDENING FOR SELECT TREE REMOVAL OF TREES > 30" DBH

N

NO SCALE

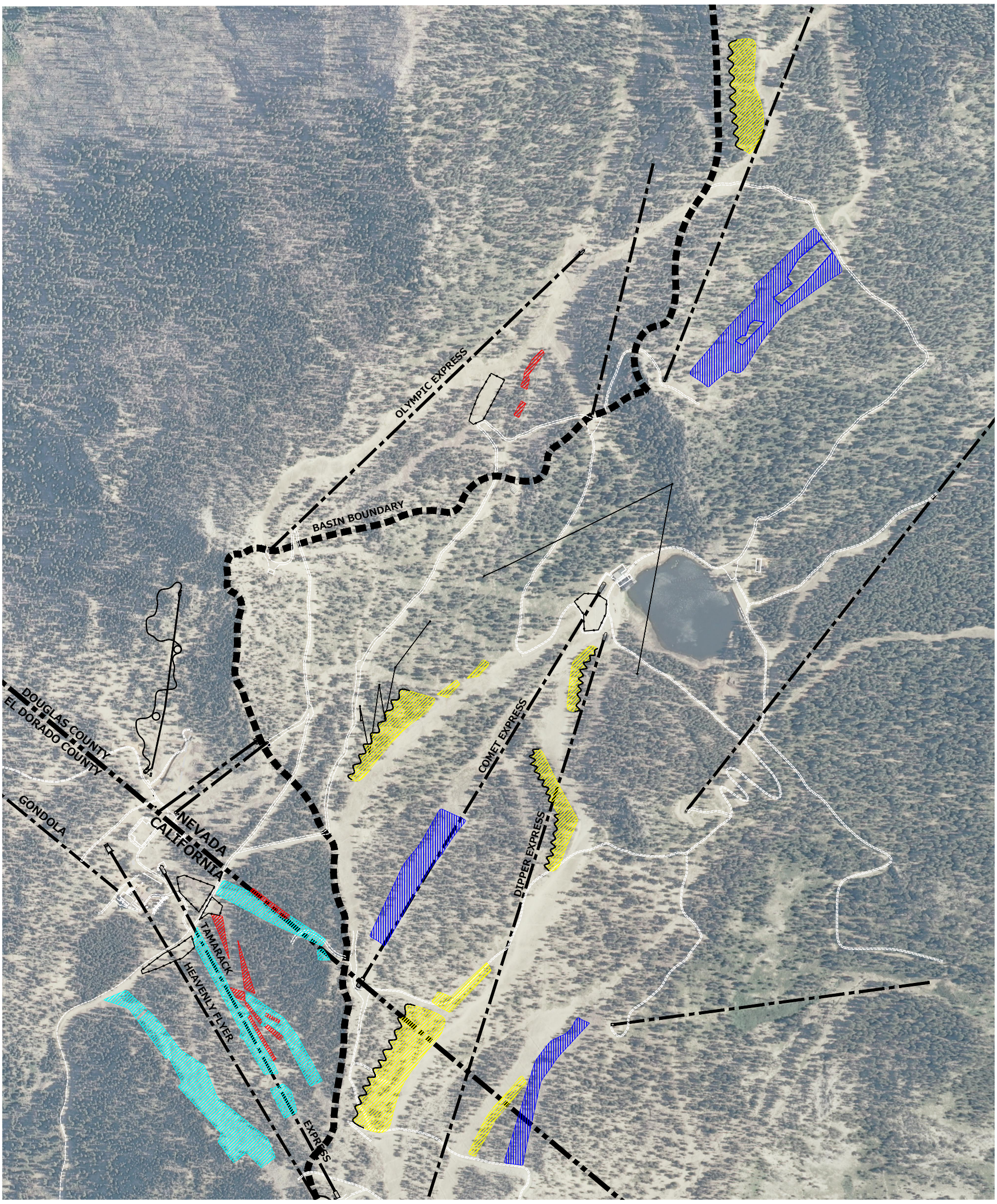
FIGURE 1

2017 CAPITAL IMPROVEMENTS PROJECT

Heavenly LAKE TAHOE

16-608.7 / 10-30-17

Resource Concepts Inc



LEGEND:

- BASIN BOUNDARY
- EXISTING SKI LIFT
- RUN WIDENING - IN BASIN
- RUN WIDENING - OUT OF BASIN
- RUN HAZARD REDUCTION - IN BASIN
- RUN HAZARD REDUCTION - OUT OF BASIN
- EDGE OF NEW WIDENING FOR SELECT TREE REMOVAL OF TREES > 30" DBH
- STAGING AREA

N

NO SCALE

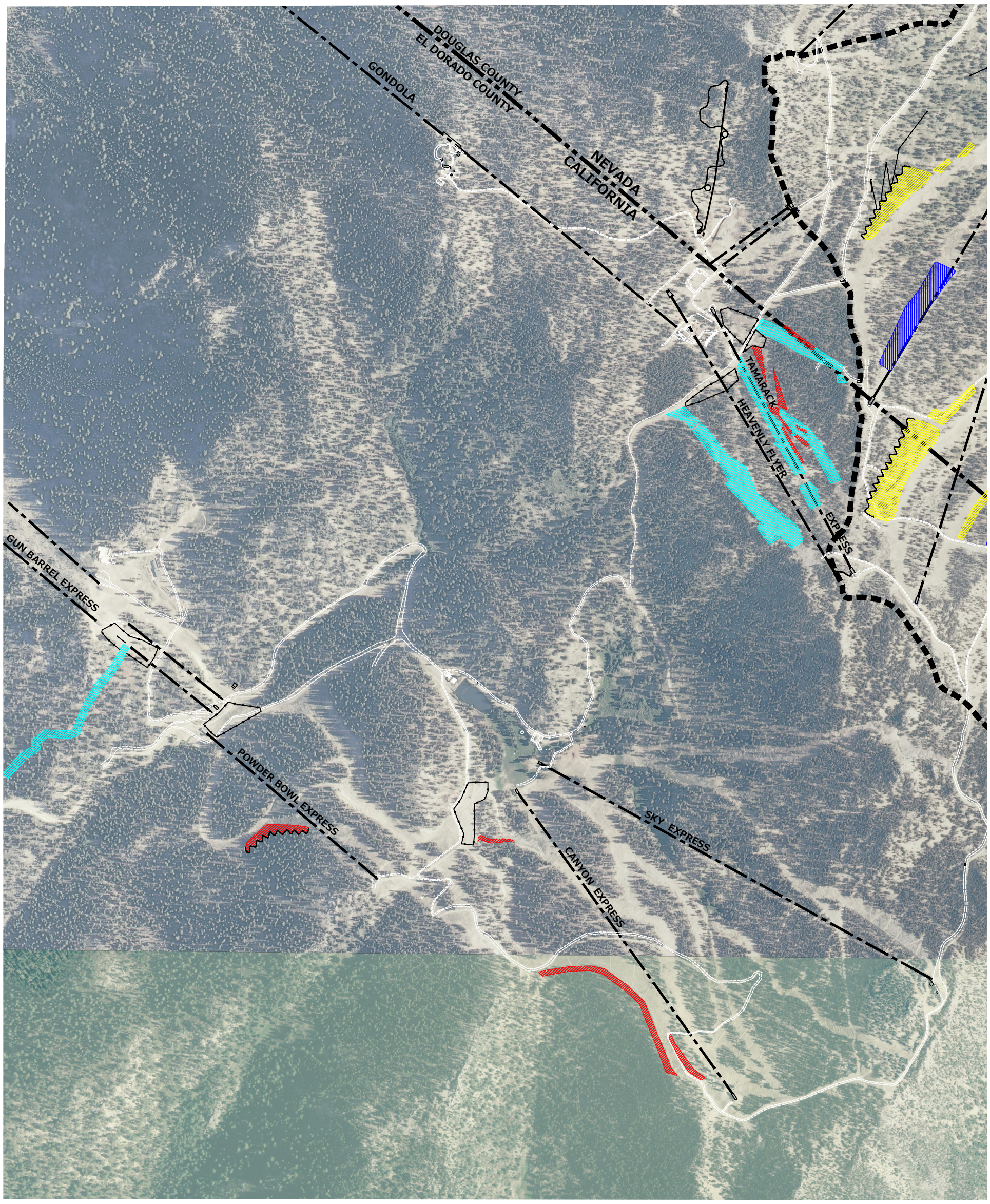
FIGURE 2

2017 CAPITAL IMPROVEMENTS PROJECT

Heavenly LAKE TAHOE

16-608.7 / 10-30-17

RCI Resource Concepts Inc



LEGEND:

- BASIN BOUNDARY
- EXISTING SKI LIFT
- RUN WIDENING - IN BASIN
- RUN WIDENING - OUT OF BASIN
- RUN HAZARD REDUCTION - IN BASIN
- RUN HAZARD REDUCTION - OUT OF BASIN
- EDGE OF NEW WIDENING FOR SELECT TREE REMOVAL OF TREES > 30" DBH
- STAGING AREA

N

NO SCALE

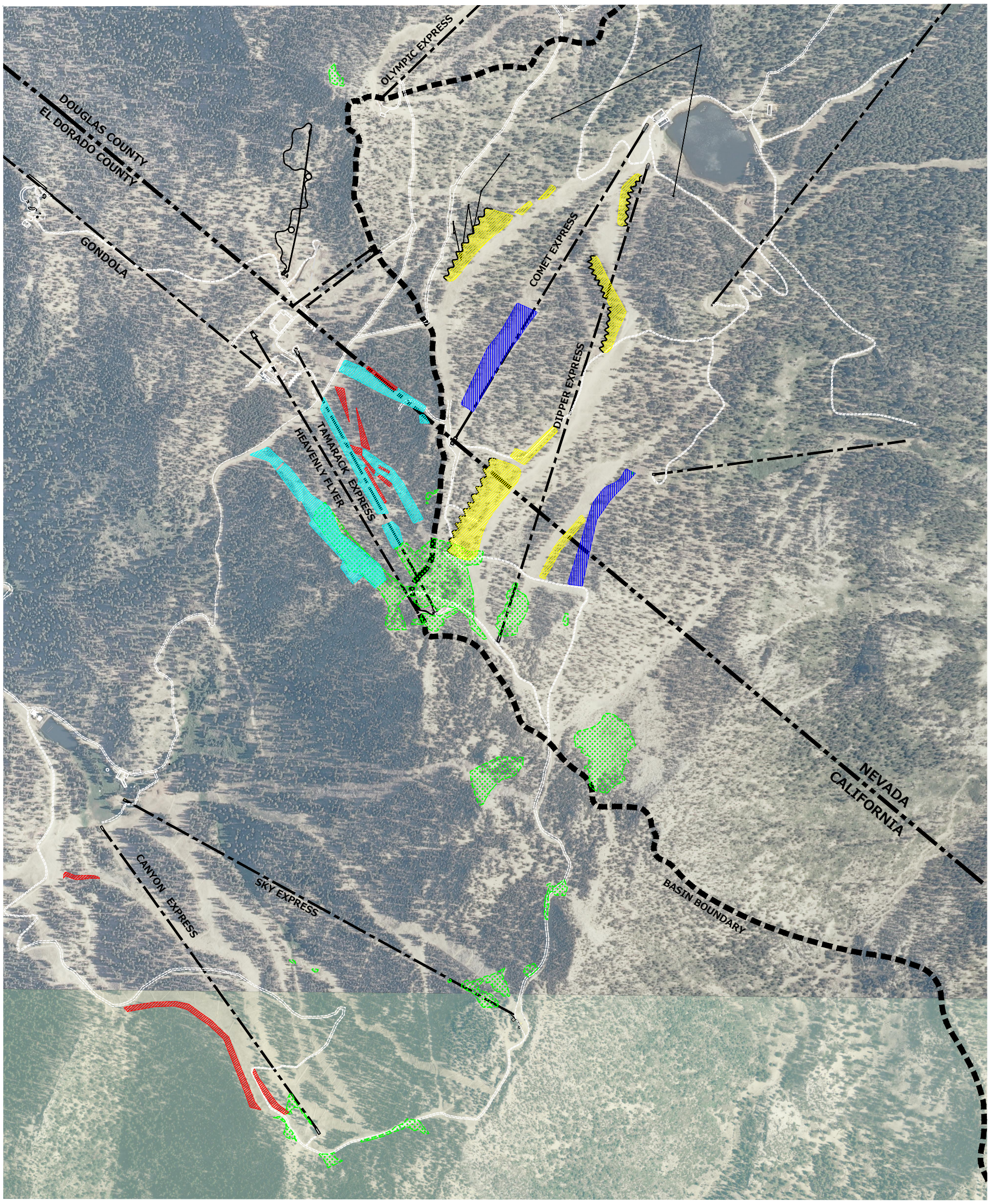
FIGURE 3

2017 CAPITAL IMPROVEMENTS PROJECT

Heavenly LAKE TAHOE

16-608.7 / 10-30-17

Resource Concepts Inc



LEGEND:

- BASIN BOUNDARY
- EXISTING SKI LIFT
- RUN WIDENING - IN BASIN
- RUN WIDENING - OUT OF BASIN
- RUN HAZARD REDUCTION - IN BASIN
- RUN HAZARD REDUCTION - OUT OF BASIN
- EDGE OF NEW WIDENING FOR SELECT TREE REMOVAL OF TREES > 30" DBH
- DRABA LOCATIONS

N

NO SCALE

FIGURE 4

2017 DRABA LOCATIONS

Heavenly LAKE TAHOE

16-608.7 / 10-30-17

Resource Concepts Inc

Appendix C

2015 Heavenly Mountain Resort Master Development Plan Mitigation and Monitoring Plan

The following presents the relevant mitigation measures from the 2015 Heavenly Mountain Resort Master Development Plan Mitigation Monitoring Plan.

7.4-1 Implement the Construction Erosion Reduction Program

Description

Refer to Attachment 1 (APPENDIX 2-B of the 06 Draft EIR/EIS/EIS) for the Construction Erosion Reduction Program (CERP) and the Watershed Management Guidebook: An Outcome-Based Guide to Watershed Management (Drake, K. and M. Hogan. 2013).

Implementation of the CERP would minimize the rate of soil loss from Heavenly Mountain Resort caused by construction activities. The program is now considered a USFS design feature for all Master Plan facility implementation at Heavenly and is updated by the USFS as necessary to be consistent with the latest Forest Service procedures for erosion control. Heavenly would be the implementing entity, and the Forest Service or TRPA would be the lead and monitoring agency. Mitigation measures contained in this program will be finalized during individual project design and implemented during construction of each new facility.

The Erosion Control Plan and Revegetation Specifications for Ski Runs and Disturbed/Developed Areas was updated and integrated as part of the CERP prepared for the MPA 07. The revegetation specification for ski trails and developed and disturbed project areas were revised and updated by an outside contractor and subsequently included in the Watershed Management Guidebook prepared by Drake and Hogan. During these revisions, monitoring results from the Environmental Monitoring Program (1995-2003) were incorporated to integrate more effective BMPs, changes in ski area management directives, improved seed mixtures, Forest Service native plant program, and Forest Service noxious weed management program into the plan. The CERP also helps facilitate project documentation and record keeping.

Impacts Mitigated

06 EIR/EIS/EIS- WATER-1: Existing Percent ERA in Watersheds CA-6, NV-1 and NV-4 are above allowable TOCs
06 EIR/EIS/EIS- WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction
06 EIR/EIS/EIS- WATER -3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks
06 EIR/EIS/EIS- WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

Mitigation Level	Future development must not increase sedimentation rates from the ski resort that would adversely impact downstream beneficial uses.	
Lead Agency	Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	At beginning of each construction project
	Complete:	Following successful implementation of construction mitigation measures.
Status	Ongoing	

7.4-3 Meet Water Quality Standards

Description	1. Heavenly shall implement the Watershed Maintenance and Restoration Program (Appendix 3.1-D of the Epic Discovery Project Draft EIR/EIS/EIS). The program should be revised and prioritized as determined by future monitoring and the Forest Service Heavenly Road Maintenance Agreement. 2. Heavenly shall continue to implement the CERP (Mitigation Measure 7.4 1). 3. Heavenly, Lahontan and the Forest Service shall implement the Environmental Monitoring Program (Mitigation Measure 7.5 2). 4.Heavenly shall install and maintain BMPs at all facilities and parking lots (Mitigation Measure 7.4-2). 5. At least one water year prior to construction of Ski Lift Z and/or Ski Trails 86, 87, 89, 91 (now Ski Trails Z1, Z2, Z4, and Z8 in the MPA 07), the Forest Service and NDEP will conduct a field visit to determine an appropriate site for installation of a monitoring station on the South Fork of Daggett Creek if the Forest Service and NDEP determine that installation of a monitoring site for water quality is necessary. 6. Snow grooming equipment and activities are not permitted on ski trails deficient of snow cover adequate enough to protect soil and water resources.	
Impacts Mitigated	06 EIR/EIS/EIS- WATER-3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks 06 EIR/EIS/EIS-WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks	
Mitigation Level	State and Regional water quality constituent standards; Updated Waste Discharge Permit.	
Lead Agency	USFS	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	USFS	
Timing	**Start:**	Ongoing.
	Complete:	Ongoing.
Status	Ongoing.	

7.4-4 Implement Adaptive Ski Run Prescriptions

Description

Heavenly shall implement the ski trail prescriptions proposed in the Easy Street Run Hazard Reduction Program (Attachment 2) on all future ski trails and selected and approved existing ski trails with significant hazards, adapting prescription techniques to monitoring results from demonstration projects. Monitoring results will be reviewed and the program amended and improved based on these results. The program is a process-based, adaptive management approach to ski trail implementation. Heavenly shall be the implementing and monitoring entity, and the Forest Service shall be the oversight and approval agency. For ski trails in the Lake Tahoe Basin, TRPA shall also be the approval agency.

Impacts Mitigated

06 EIR/EIS/EIS-WATER-1: Existing Percent ERA in Watersheds CA-6, NV-1 and NV-4 are above allowable TOCs
06 EIR/EIS/EIS-WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction
06 EIR/EIS/EIS-WATER-3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks
06 EIR/EIS/EIS-WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

Mitigation Level

Future development must not increase sedimentation rates from the ski resort that would adversely impact downstream beneficial uses.

Lead Agency

TRPA

Implementing Agency

Heavenly Mountain Resort

Monitoring Agency

TRPA

Timing

Start: Ongoing.

Complete: Ongoing.

Status

Ongoing and adapted to monitoring results and new technologies

7.4.6 Avoid and/or Restore Future Disturbed SEZs

Description

MPA 07 Projects

Implementation of the following mitigation measures will reduce the impact from future SEZ disturbance to less than significant. Depending on project location, the Forest Service, TRPA, or Lahontan will be the lead and monitoring agencies. Heavenly will be the implementing entity. Mitigation implementation will occur at or before the time of development of the new MPA 07 facility.

In-Basin

1. Run widening activities (Ski Trails I1, H9, H10, H11, S2, and Z2) will be conducted over the snow, or by other means that do not cause ground disturbance, and ONLY coniferous trees will be felled and left in place. Shrubs and herbaceous vegetation will remain, no ground disturbance will occur, and hydrologic function of the SEZ will be preserved.
2. Heavenly shall, prior to the time of construction of Ski Trails H13, 12,

and 5a, design the ski trails to avoid new disturbance to SEZs and SEZ setbacks or minimize if avoidance is not possible as determined jointly by the Forest Service, TRPA, and Lahontan. If impacts to hydrologic function or permanent degradation to riparian communities are determined, findings must be made for TRPA Code of Ordinances 30.5.2 and the Lahontan Basin Plan (restoration at a minimum of 1.5:1 ratio and net environmental benefit).

3. Upon replacement of Boulder Ski Lift (Ski Lift Q), the ski lift base will be relocated outside the SEZ along with all buildings involved in Boulder Operations. Alternatively, facilities may be moved to the existing Boulder parking lot if TRPA determines that the relocation area is man-modified and does not require restoration. Ski Lift Q must be replaced in its current alignment, and no direct disturbance or indirect impacts to the Edgewood Creek SEZ Restoration project area will be permitted.
4. No vehicles or equipment are permitted off road in SEZs without justification and prior approval from TRPA, Lahontan, and the Forest Service.
5. Channel and streambed stability are important components of sediment reduction and SEZ functionality. Therefore, hand pruning methods will be used to maintain riparian vegetation at a minimum height of 3 feet in the vicinity of active low flow channels. The vicinity will be defined as between the banks and within a 5-foot buffer on either side of the channel. Mechanical thinning could occur outside the designated channel and buffer area.
6. All tree removal/cutting activities for construction of the ski lifts will be conducted to reduce the potential for ground disturbance within SEZs. Mechanisms for cutting trees will be over the snow or involve the use of helicopters.
7. Sky Meadows and the portion of Heavenly Valley Creek, which feeds the meadow, will be restored (according to a Restoration Plan prepared by a third party and approved by TRPA and the Forest Serviced) after removal of the Sky Meadows facilities and deck. Decommissioned road segments R93 and R94 will remain closed.
8. If avoidance is not possible pursuant to mitigation measure 1, Heavenly will apply for and seek exemption findings from the Lahontan and TRPA and implement appropriate restoration in the minimum amount of 1.5 times the area of new disturbance.
9. For projects within jurisdictional wetlands and waters, a Section 404 permit from the USACE and water quality certification from Lahontan (in California) will be required.

Out-of-Basin

1. Heavenly will remove coniferous trees and trim only the tops of vegetation (to a height of no less than 3 feet tall) along the SEZ portions of Ski Trails 17, 18, U3, U4, Z1, Z2, Z3, Z4, Z8.
2. Heavenly will, for development in SEZs/RCAs outside the Lake Tahoe Basin, comply with relevant Forest Service BMPs and guidelines regarding development within RCAs to minimize the severity of impacts to SEZs/RCAs from development, including restoration of up to 37.29 acres (24.86 times ratio of 1.5:1) of SEZs/RCAs outside the Lake Tahoe Basin.
3. Heavenly will, for development in SEZs/RCAs outside the Lake Tahoe Basin, minimize the areal extent and intensity of the impacts including, but not limited to, use of helicopters to install ski lift towers.

4. Channel and streambed stability are important components of sediment reduction and SEZ functionality. Therefore, Heavenly will minimize operational impacts to the SEZs/RCAs by using hand-pruning methods to maintain riparian vegetation at a minimum height of 3 feet in the vicinity of active low flow channels. The vicinity will be defined as between the banks and within a 5-foot buffer on either side of the channel. Mechanical thinning could occur outside the designated channel and buffer area.
5. For projects within jurisdictional wetlands and waters, a Section 404 permit from the USACE and water quality certification from Lahontan (in California) will be required.

Impacts Mitigated

06 EIR/EIS/EIS- SEZ-3: SEZ Disturbance due to the Construction of Proposed Facilities

06 EIR/EIS/EIS- SEZ-4: Disturbance of Jurisdictional Wetlands and Waters Due to the Construction of Proposed Facilities

Mitigation Level

Compliance with TRPA & Forest Service criteria for disturbance within an SEZ.

Lead Agency

TRPA, Lahontan and Forest Service

Implementing Agency

Heavenly Mountain Resort

Monitoring Agency

TRPA and Forest Service

Timing

Start: Prior to development of a new facility.

Complete: Upon completion of the proposed facility.

Status

Ongoing, with restoration projects completed.

7.4-7 Avoid and/or Restore Future Disturbed Jurisdictional Wetlands and Waters

Description

MPA 07 Projects

Implementation of the following mitigation measures will reduce the impact to less than significant. The Forest Service and USACE will be the lead and monitoring agencies. Lahontan may be a lead and monitoring agency for 401 Certification of projects located in California. Heavenly will be the implementing entity. Mitigation will occur at or before the time of development of the new MPA 07 facility.

1. Heavenly will, before development begins, complete a jurisdictional wetlands delineation to determine the actual location of jurisdictional wetlands and waters surrounding the specific project.
2. Heavenly will avoid development within the wetlands and waters to the extent possible as determined jointly by USACE and the Forest Service.
3. Heavenly will, if development within the wetlands cannot be avoided, obtain a Section 404 permit from the USACE or approval under existing general permits, including water quality certification (Section 401) by Lahontan (in California), and comply with all requirements of the permit to mitigate specific impacts of the project (including coordinating with CDFW to comply with Section 1600 of the FGC if there is removal of riparian vegetation).
4. Sky Meadows Lodge and Deck (CA-1), the Base of Ski Lift Q (NV-3), and Boulder Operations will be relocated to locations outside delineated wetland boundaries to reduce impacts caused by past projects.
5. All tree removal activities for construction of ski lifts and ski trails will be conducted to reduce the potential for ground disturbance within wetlands or

jurisdictional waters.
6. Additionally, as stated in the Updated Waste Discharge Permit (Board Order NO. R6T-2003-0032, page 15) for projects that impact SEZs [or wetlands] in California, "…any disturbance to SEZ [or wetlands] for new construction is prohibited unless the Regional Board provides an exemption to prohibitions against discharge or threatened discharge of wastes attributable to new development in SEZ [or wetlands]. If the Regional Board provides an exemption, additional mitigation measures may also be required for their permitting."

Impacts Mitigated 06 EIR/EIS/EIS- SEZ-4: Disturbance of Jurisdictional Wetlands and Waters Due to Construction of Proposed Facilities

Mitigation Level Compliance with U.S. Army Corps of Engineers wetlands permitting requirements.

Lead Agency U.S. Army Corps of Engineers and Lahontan

Implementing Agency Heavenly Mountain Resort

Monitoring Agency U.S. Army Corps of Engineers

Timing
Start: Prior to development of a new facility.
Complete: Upon completion of the proposed facility.

Status Ongoing, with restoration projects completed.

7.4-11 Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows

Description

1. Heavenly Mountain Resort shall retain a qualified biologist to conduct a preliminary vegetation survey prior to the project-level design or approval of any proposed facility. This vegetation survey shall identify all deciduous trees, wetlands, and meadows located within or adjacent to the proposed construction corridor and shall delineate facility-siting alternatives that avoid the loss or degradation of these resources. Heavenly Mountain Resort, through consultation with the Forest Service and TRPA, shall then implement a final engineered facility siting alternative that avoids the loss or degradation of riparian or wetland plant communities.

2. If TRPA, Lahontan, and the Forest Service jointly determine (the Forest Service, Lahontan, and TRPA shall determine separately on lands of individual jurisdiction) that the construction of any new facility cannot be sited to avoid the loss or degradation of riparian or wetland plant communities, the areal extent of the impact and the intensity of the impact shall be minimized. Methods for minimizing impact shall include, but not be limited to, the realignment of facilities to minimize the acreage of riparian or wetland plant communities affected, hand excavation adjacent to riparian or wetland plant communities, and use of helicopters to install ski lift towers and other facilities. For each acre of disturbed riparian or wetland vegetation, an area 1.5 times the impacted area shall be restored or created within the special use permit boundary.

Impacts Mitigated 96 Final EIR/EIS/EIS: Loss or degradation of native vegetation associations due to the construction of new MP 96 facilities.

06 EIR/EIS/EIS-7.4-8: Loss or degradation of native vegetation associations due to the construction of new MPA 07 facilities.

Mitigation Level Non-degradation of deciduous trees, wetlands, and meadows.

Lead Agency	TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Prior to the approval of a MPA 07 project.
	Complete:	Upon completion of construction or, if necessary, following implementation of vegetation creation and restoration.
Status	Ongoing	

7.4-12 Active Raptor and Migratory Bird Nest Site Protection Program

Description	Pre-construction surveys, conducted during the nesting season immediately prior to project construction, shall be conducted to identify any active raptor nest sites within the selected alignment. During initial construction activities (tree removal), a Forest Service qualified biological monitor shall be onsite to evaluate whether any raptors or migratory birds are occupying trees within 100 feet of the construction corridor. The biological monitor will have the authority to stop construction near occupied trees if it appears to be having a negative impact on nesting raptors or migratory birds or their young observed within the construction setbacks of the project area. If construction is stopped, the monitor must consult with, Forest Service and TRPA staff within 24 hours to determine appropriate actions to continue construction while reducing impacts to identified raptors or migratory birds.	
Impacts Mitigated	06 EIR/EIS/EIS-BIO-2: Loss of active raptor and migratory bird nests.	
Mitigation Level	Protection of raptor and migratory bird nests and fledglings.	
Lead Agency	Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Pre-construction of projects.
	Complete:	Upon completion of construction activities.
Status	Ongoing, as projects are proposed.	

7.4-13: Monitor and Protect Northern Goshawk

Description

1. Surveys for northern goshawk shall be funded by Heavenly and conducted by the Forest Service or by others approved by the Forest Service prior to the onset of any project that proposes to affect suitable northern goshawk habitat or any project located within 0.5 mile of suitable northern goshawk habitat. All surveys shall be in accordance with the most recent Forest Service Region 5 protocol. If a northern goshawk nesting territory is discovered, a Protected Activity Center shall be delineated in accordance with the Sierra Nevada Forest Plan Amendment Record of Decision (January 2004). A LOP must be maintained to prohibit activities or vegetation treatments which may disrupt breeding within ¼ mile of the PAC from February 15 through September 15. The LOP may be waived if surveys confirm nesting is not occurring or if the activity is of such scale and duration that impacts to breeding Northern goshawks would not occur.

A one-quarter mile disturbance zone surrounding the nesting tree shall be delineated in accordance with TRPA Code of Ordinances 62.4.1(A) for in-basin areas. No manipulation of the habitat within the disturbance zone is allowed unless manipulation is necessary for habitat enhancement.

2. Heavenly Mountain Resort shall fund and the Forest Service or the TRPA shall prepare (and both the Forest Service and TRPA shall approve) updated northern goshawk habitat maps at 5-year intervals throughout the life of the MPA 07. These maps shall reflect the loss or modification of existing suitable northern goshawk habitat and shall identify new habitat areas created by the maturation of early and mid-successional forest stands and shall be based on the latest scientific information. The updated northern goshawk habitat maps shall be used to identify areas that must be surveyed for northern goshawk prior to allowing construction activities to proceed. Updated habitat maps shall not interrupt two-year survey protocols. Maps utilized for the first year of surveys shall be utilized for the second year of surveys regardless if updates occur.

Impacts Mitigated 96 Final EIR/EIS/EIS Disturbance of northern goshawk nesting or foraging habitat.

06 EIR/EIS/EIS – BIO-4: Loss of sensitive (including Management Indicator Species) wildlife individuals or habitat?

Mitigation Level Maintenance of northern goshawk habitat at Heavenly; protection of nesting goshawks from noise and human disturbance.

Lead Agency TRPA

Implementing Agency Heavenly Mountain Resort

Monitoring Agency TRPA

Timing **Start:** Project Review.

Complete: Ongoing.

Status Ongoing

7.4-14 BIO-4: Wildlife Nursery Site Survey

Description Heavenly Mountain Resort shall conduct a thorough pre-construction survey of project areas for wildlife nursery sites and den locations. The survey shall be performed by a professional biologist with experience locating nursery/den sites and shall be performed prior to initial ground disturbance for a project activity. The survey area shall include the location of ground disturbance and areas within 100 meters of ground disturbing activities, as well as any area where staging will occur or access will be provided for construction equipment. The Biologist shall report the findings of the survey to the USFS LTBMU. If a Pacific marten den site is located, a 100-acre buffer of the highest quality habitat shall be identified surrounding the den site to comply with the SNFPA Final SEIS Record of Decision page 39 (January 2004). However, the final decision can be made at the local level by the Forest Supervisor to reflect site-specific conditions and may not require the implementation of an 100-acre buffer.

Impacts Mitigated Epic Discovery EIR/EIS/EIS - BIO-4: Would the Project cause a loss of wildlife nursery/den sites and associated habitat?

Mitigation Level Protection of identified nursery/den sites.

Lead Agency USFS

Implementing Agency	USFS and Heavenly Mountain Resort	
Monitoring Agency	USFS	
Timing	**Start:**	Prior to construction of Epic Discovery Projects.
	Complete:	Ongoing.
Status	New measure for Epic Discovery Project	

7.5-6 Maintain Water Flows in Heavenly Valley Creek

Description

1. Heavenly shall implement the Water Rights/Water Use Monitoring Program so that it can be determined how much water is used in California and Nevada both in- and out-of-basin.
2. Heavenly shall, using the upgraded monitoring station at Heavenly Valley Creek station HV-C1A (upstream of California Reservoir), continue to monitor the inflow to the Reservoir, so that the required release rates are known.
3. Heavenly shall operate the California Reservoir such that the minimum release requirements are complied with.
4. Heavenly shall document compliance in the annual water use/water rights report (Mitigation Measure 7.5-3), to include flow records at HV-C1A, California Reservoir release records and flow records at HV-C2.
5. Heavenly shall, if water use does not conform with water rights and the Reservoir operating permit, modify future operation of the Reservoir to comply with the water right and operating permit restrictions.
6. Heavenly shall obtain water for summertime irrigation from sources other than Heavenly Valley Creek.
7. Heavenly shall manage the California Reservoir and Dam such that the Dam releases equal the inflow to the Reservoir during the summer such that instream flows are not decreased.

Impacts Mitigated	96 Final EIR/EIS/EIS: Water diversions from Heavenly Valley Creek may result in violations of water right requirements 96 Final EIR/EIS/EIS: Future increased creek water diversions from Heavenly Valley Creek may result in violation of water right requirements. 96 Final EIR/EIS/EIS: Diversion of creek water from Heavenly Valley Creek for summer irrigation of revegetation/restoration sites may constitute a nonattainment of the TRPA fisheries threshold concerning instream flows.	
Mitigation Level	Compliance with water right requirements for Heavenly Valley Creek. Compliance with TRPA instream flow threshold for Heavenly Valley Creek.	
Lead Agency	TRPA and Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Upgraded monitoring station shall be installed within 90 days after approval of the Heavenly Mountain Resort MP 96.
	Complete:	Ongoing.
Status	Ongoing. The upgraded monitoring station was funded in 2004 by Vail Resorts. Data is now being recorded. Annual water use reports are being prepared.	

7.5-16: Protect Tahoe Draba Populations within Heavenly Mountain Resort

Description

1. *Surveys:* All facilities that are proposed to be located within potential Tahoe draba habitat shall have surveys performed prior to site planning for the subject facility. All in-basin Tahoe draba plants shall be avoided and protected using protective measures identified below for in-basin projects.
2. *Fencing:* For out-of-basin projects and for in-basin projects as outlined below in #4, minimize loss of Tahoe draba plants by installing protective fencing around occupied habitat that is adjacent to Forest Service approved construction projects. Heavenly shall install resource protection fencing in areas of known Tahoe draba occurrences that are immediately adjacent to facilities, trails, roadways or other activities that may impact existing plants. The resource fencing shall be placed in the specified locations on a seasonal basis after the snow melts and before summer activities (e.g., public operation and construction/maintenance crews) commence. The goal of the resource protection fencing is to prevent both vehicular access and to eliminate the ability for people to access the protected area. The fence shall be composed of metal stakes placed at a maximum distance of 20 feet for the extent of the length. A minimum of three ropes, at least 4 feet in height, shall be tied to the posts so as to prevent access across the fence line. For fencing placed along roadways, it shall be placed at the edge of the road surface below the toe of the slope on which the plants exist so as to maximize protection. Additionally, interpretative signage shall be placed along the fence line to identify the Tahoe draba. The fencing shall be removed at the end of the dry season after construction access or recreational activities have ceased.
3. *Boardwalks:* In order to further protect Tahoe draba habitat and existing plants, elevated boardwalks will be used to cross sensitive areas for access to the Sky Meadows Coaster and Sky Meadows Zipline Canopy Tour. These boardwalks shall be elevated a minimum of 6 inches above the soil surface and be constructed of grated material that allows light and moisture to pass. The purpose of the boardwalk is to allow for the movement of soil below and to maintain habitat connectivity and not further fragment suitable habitat for Tahoe draba.
4. *Avoidance:* For in-basin projects, avoid loss of Tahoe draba by siting facilities away from Tahoe draba populations and by installing protective fencing around occupied habitat where it is adjacent to proposed facilities.
5. *Rock Removal:* Construction activities should avoid capping rocks/boulders that have Tahoe draba growing near them. If rocks must be capped near Tahoe draba populations, existing plants shall be covered during blasting with canisters or other approved protective measures. This measure is in addition to fencing described above in bullet number 2.
6. *Monitoring:* Fences and blasting operations near Tahoe draba plants shall be monitored for the duration of the construction season by contractors, Heavenly staff, and Forest botanists to ensure compliance.
7. *Interpretive Program:* Develop and implement an employee orientation and training program for Tahoe draba for those employees associated with summer operations, such as interpretive programs, zip line, and hiking trails. Interpretive materials may include a description or illustration of Tahoe draba, an overview of the plant's natural history, general locations of the species at Heavenly, and measures that could be employed to protect the plant and its

habitat from disturbance. Interpretive materials and services should be provided at entry points for summer visitors to the resort.

Impacts Mitigated

2006 EIR/EIS/EIS – VEG-1: Loss directly or indirectly (including through spread of noxious weeds), of individuals or habitat of endangered, threatened, or rare (CNPS 1B) plant species?

1996 EIR/EIS/EIS - Potential loss or disturbance of Tahoe draba populations within the Master Plan Development Area. (Existing 1994-95 Conditions plus 1996 Master Plan)

Loss or disturbance of Tahoe draba populations due to increased summer recreational activity. (Existing 1994-95 Conditions plus 1996 Master Plan)

Epic Discovery EIR/EIS/EIS - VEG-2: Would the Project result in an overall decrease in long term trends in Tahoe draba populations within the Project area?

Mitigation Level Maintenance of existing Tahoe draba populations at Heavenly.

Lead Agency Forest Service (Mountain Wide) and TRPA (In-Basin)

Implementing Agency Heavenly Mountain Resort

Monitoring Agency Forest Service (Mountain Wide)

Timing

Start: Project planning.

Complete: Ongoing.

Status Ongoing

7.5-17 Minimize Loss/Degradation of Sensitive Plant Species

Description

1. Heavenly Mountain Resort shall retain a qualified biologist, funded by Heavenly or fund Forest Service personnel, to conduct a preliminary sensitive plant survey prior to project level siting of any proposed facility within the Heavenly Mountain Resort permit area. The purpose of the survey shall be to identify occurrences of any LTBMU sensitive plant species (note: Tahoe draba is addressed in Measure 7.5-16) within or adjacent to the proposed construction corridor and to develop facility siting alternatives that avoid or minimize the loss or degradation of sensitive plants.
   - If sensitive plants are present in project area then at a minimum, a 100 ft buffer will be placed around the plants and the facility shall be sited outside of the buffer.
   - If the 100 ft buffer is not feasible, additional mitigation measures may be discussed for the following plant species: Galena Creek rock cress, Cup Lake draba, long-petaled lewisia, and three-ranked hump-moss.
   - If the 100 ft buffer cannot be accommodated or impacts to the species cannot be mitigated, additional mitigation measures will not be allowed for the following species, unless there is an increase in current populations: Arabis tiehmii (Tiehm's rock cress), Botrychium ascendens (upswept moonwort), Botrychium crenulatum (scalloped moonwort), Botrychium lineare (slender moonwort), Botrychium lunaria (common moonwort), Botrychium minganense (Mingan moonwort), Botrychium montanum (western goblin), Bruchia bolanderi (Bolander's candle moss), Epilobium howellii (subalpine fireweed), Erigeron miser (starved daisy), Eriogonum umbellatum var. torreyanum (Torrey's or Donner Pass buckwheat), Helodium blandowii (Blandow's bog-moss), Hulsea

brevifolia (short-leaved hulsea), Lewisia kelloggii ssp. hutchisonii (Kellogg's lewisia), L. k. ssp. kelloggii (Kellogg's lewisia), Meesia ulignosa (broad-nerved hump-moss) and Peltigera hydrothyria (veined water lichen).

- The Forest Service will determine any additional mitigation measures for species on the sensitive plant list that are not included in this environmental document based on the known occurrence information.
- If watch list species are found in the project area, mitigation measures will be discussed and be based on species presence and distribution.

2. In order to minimize disturbance in potential habitat for TES species, facilities should be sited to avoid the following habitats:
   - Riparian areas, wetlands, and meadow vegetation
   - Old growth sites where trees are greater than 30 in dbh
3. Because of limited information pertaining to the effect of man-made snow on sensitive plants, snow guns shall not be placed where snowmaking would directly affect any sensitive plant species.
4. Prior to the final approval of any proposed facility within the permit boundaries, Heavenly Mountain Resort shall prepare or fund a qualified biologist to prepare a project-level biological evaluation (BE) pursuant to Forest Service policy. The BE prepared for each project within Heavenly Mountain Resort MPA 07 Development Area shall incorporate information from the Heavenly Mountain Resort MPA 07 Programmatic BE, as well as information obtained during project-specific biological field surveys. Based on this information, the project level BEs shall identify potential project impacts to sensitive plants and fungi and incorporate mitigation measures to reduce these impacts. The recommendations of the BE shall be approved by the Forest Service and TRPA prior to the onset of construction of any new facility at the Heavenly Mountain Resort.

Impacts Mitigated 06 EIR/EIS/EIS – VEG-1: Loss directly or indirectly (including through spread of noxious weeds), of individuals or habitat of endangered, threatened, or rare (CNPS 1B) plant species?

Mitigation Level Maintenance and protection of potential existing sensitive plant populations at Heavenly.

Lead Agency TRPA and Forest Service

Implementing Agency Heavenly Mountain Resort

Monitoring Agency Forest Service

Timing
Start: Project construction.
Complete: Ongoing.

Status Ongoing

7.5-18 Invasive Plant Management

Description

1. As a term and conditions of Heavenly Mountain Resort's Special Use Permit, Heavenly will develop a long-term integrated weed management plan. This plan should include annual monitoring associated with existing weed infestations and new project construction. Plans should include control and abatement plans, restoration and revegetation plans, and annual reporting

requirements (weed treatments, infestation sizes, and locations will be reported). Currently, three noxious weed species are located within Heavenly Mountain Resort's boundary on both Forest Service and privately owned land: tall whitetop (*Lepidium latifolium*), Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*).

2. Summertime maintenance and excavation equipment vehicles used for project implementation should be weed free and cleaned of all attached mud, dirt, and plant parts before entering the project area. This practice shall be done at a vehicle washing station or steam cleaning facility (power or high-pressure cleaning) before the equipment and vehicles enter the project area.
3. Equipment, materials, or crews shall not be staged in noxious weed infested areas.
4. All gravel, fill, mulches or other materials should be weed free. Use onsite sand, gravel, rock or organic matter where possible. Otherwise, obtain materials from gravel pits and fill sources that have been determined to be weed-free by the Forest Service Noxious Weed Coordinator. Topsoil from disturbance will be saved and put back to use in onsite revegetation, unless contaminated with noxious weeds.
   All activities that require seeding or planting should use locally collected native seed sources whenever possible. Plant and seed material should be collected from as close to the project area as possible, from within the same watershed and at a similar elevation whenever possible. Persistent non-natives such as timothy (Phleum pretense), orchardgrass (Dactylis glomerata), or ryegrass (Lolium sp.) should be avoided. Seed mixes should be approved by Forest Service Botanists.
5. Weed infestations identified before project implementation that are within the project area should be treated or "flagged and avoided" according to the species present and project constraints. Before the implementation of the Epic Discovery Project, Heavenly will treat and monitor the existing locations of tall whitetop located near the top of the Tamarack Chairlift (#296) and Sky Chairlift (#169).
6. Construction areas should be monitored for 3 years post-project to ensure that no new weed infestations move into the area disturbed during project implementation.
7. Heavenly will implement an annual employee orientation and training program for employees that work in ground disturbing activities. Training could include an introduction to the noxious weeds currently present on the mountain, (tall whitetop, Canada thistle, and bull thistle), photographs of the weeds, a map identifying known weed locations, and a list of the mitigation measures being implemented to eradicate the noxious weeds.

Impacts Mitigated	06 EIR/EIS/EIS – VEG-1: Loss directly or indirectly (including through spread of noxious weeds), of individuals or habitat of endangered, threatened, or rare (CNPS 1B) plant species?
Mitigation Level	Maintenance and protection of potential existing sensitive plant populations at Heavenly.
Lead Agency	Forest Service
Implementing Agency	Heavenly Mountain Resort
Monitoring Agency	Forest Service
Timing	**Start:** Project construction.

	Complete:	Ongoing.
Status	Ongoing	

7.5-20 BIO-3 Migratory Bird and Habitat Utilization Survey

Description	In order to protect migratory bird nests from increased human presence in the tree canopy during the breeding season, Heavenly Mountain Resort shall perform nesting bird surveys for the following projects: Mid-Station Canopy Tour, Sky Cycle Canopy Tour, East Peak Zipline Canopy Tour, Sky Meadows Zipline Canopy Tour and the Sky Meadows Challenge Course. The surveys shall be completed annually prior to the start of project operations during the breeding season (April –August). The surveys shall identify migratory birds nesting on or immediately adjacent to proposed structures (including trees used as platforms) and equipment associated with the above-listed projects (projects that are located within the forest canopy). To better understand the extent of migratory bird utilization of the habitats located in the above referenced project locations, bird point counts shall be performed to determine species diversity, nesting data as well as population size. The first point count survey of the project areas shall be performed prior to commencement of construction activities during nesting season. The results of the initial baseline survey shall be compared to future nesting surveys performed on an annual basis, in the vicinity of the projects. Daily inspection surveys of the project facilities shall be conducted by the operator to determine the presence of bird nesting activity. If the nest is not active (does not contain either eggs or hatchlings/young) the nest may be removed. If a migratory bird nest is located on a structure (including tree based platforms) or equipment associated with a project during annual surveys and is found to be active (containing either eggs or hatchlings/young), a buffer avoidance zone shall be instituted until it has been determined the nestlings have fledged. The distance of the buffer avoidance zone shall be determined by USFS and shall reflect the tolerance level of the individual pair, species, level of activity/disturbance and duration. Project activities and operations associated with the forest canopy based projects shall cease within the identified buffer avoidance zone if determined necessary to protect the active nest by USFS, NDOW and CDFW biologists. Annual surveys shall be performed indefinitely to alleviate impacts to future nests.	
Impacts Mitigated	Epic Discovery EIR/EIS/EIS - BIO-3: Would the Project have an adverse effect to migratory land bird species or their associated habitats?	
Mitigation Level	Protect active bird nests (e.g., containing either eggs or hatchlings/young).	
Lead Agency	USFS	
Implementing Agency	USFS and Heavenly Mountain Resort	
Monitoring Agency	USFS	
Timing	**Start:**	Prior to construction of Epic Discovery Projects that utilize tree canopy.
	Complete:	Ongoing.
Status	New measure for Epic Discovery Project	

7.5-21 BIO-8 Wildlife Trash Management and Education Program

Description	Heavenly Mountain Resort shall create and implement a trash management program for the entire resort. The program shall consist of installation of wildlife proof trash containers located at each of the lodge facilities and food service areas within the resort. A trash removal and management plan shall also be formulated and implemented to expedite timely removal of refuse from deposition points to approved collection points located at the base areas or to a point designated outside the resort. The removal and management plan shall include specified storage areas and practices within each facility to prevent access to refuse by wildlife species. An educational component of said plan shall be included in an effort to decrease litter and improper feeding of and ramifications to wildlife. The education program shall be directed toward Heavenly Mountain Resort staff through training, and toward the public through signage and presentations throughout the proposed Epic Discovery project locations. The plan shall be reviewed annually by Forest biologist.	
Impacts Mitigated	Epic Discovery EIR/EIS/EIS - BIO-8: Would The Project result in increased human/wildlife interactions?	
Mitigation Level	Minimize interactions between humans and wildlife.	
Lead Agency	USFS	
Implementing Agency	USFS and Heavenly Mountain Resort	
Monitoring Agency	USFS	
Timing	**Start:**	Prior to implementation of Epic Discovery Projects.
	Complete:	Ongoing.
Status	New measure for Epic Discovery Project	

7.5-22 Maintain Timber Thinning Practices

Description	Heavenly Mountain Resort shall be required to continue working with the Forest Service in determining areas that require timber thinning practices as established by the LTBMU Land and Resource Management Plan to reduce the potential for rapid and intensive wildfire spread due to excessive fuel loading. In addition, non-flammable materials shall be used on roofs, and cleared ingress/egress at base areas will be a priority. Timber thinning practices shall be consistent with the management criteria developed for maintenance and enhancement of wildlife habitat values.	
Impacts Mitigated	96 Final EIR/EIS/EIS: Potential exposure of future ski resort visitors to wild/forest fires. 96 Final EIR/EIS/EIS: Indirect effects to wildlife and fisheries.	
Mitigation Level	Controlled fuel loading.	
Lead Agency	Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MP 96.
	Complete:	Ongoing.
Status	Ongoing	

Appendix D

Projects Considered for Cumulative Effects

Past Projects considered for cumulative effects analysis

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach.

1) A catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been affected by the construction and management of the resort which leads to its current state today. Attempting to isolate the individual actions that continue to have residual impacts would be nearly impossible.
2) Providing the details of past actions, on an individual basis, would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions can risk ignoring the important residual effects of past natural events, which also contribute to cumulative effects by looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects.
3) Public scoping for this project did not identify any public interest or need for detailed information on individual past actions.
4) The Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." (Connaughton 2005)

The cumulative effects analysis in this EA is consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

> "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all

individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision making. (40 CFR 1508.7)"

Present and Ongoing Projects considered for cumulative effects analysis

Maintenance and Maintenance

Roads Maintenance
Trails Maintenance
Roads Access and Travel Management Plans
Trails Access and Travel Management Plans
Recreation Residence Tracts BMP Retrofit
Heavenly Mountain Resort Ski Area Master Plan (See Chapter 3 of the Heavenly Master Development Plan 2015)
Heavenly Mountain Resort EPIC Summer Uses (See Chapter 3 of the Heavenly Master Development Plan 2015)
LTBMU Invasive Weeds Treatment

Reasonably Foreseeable Future Projects considered for cumulative effects analysis

Burke Creek Highway 50 Crossing and Realignment Project

Other Agencies Projects or on-going uses

Maintenance and Use of other agencies recreation and administration sites